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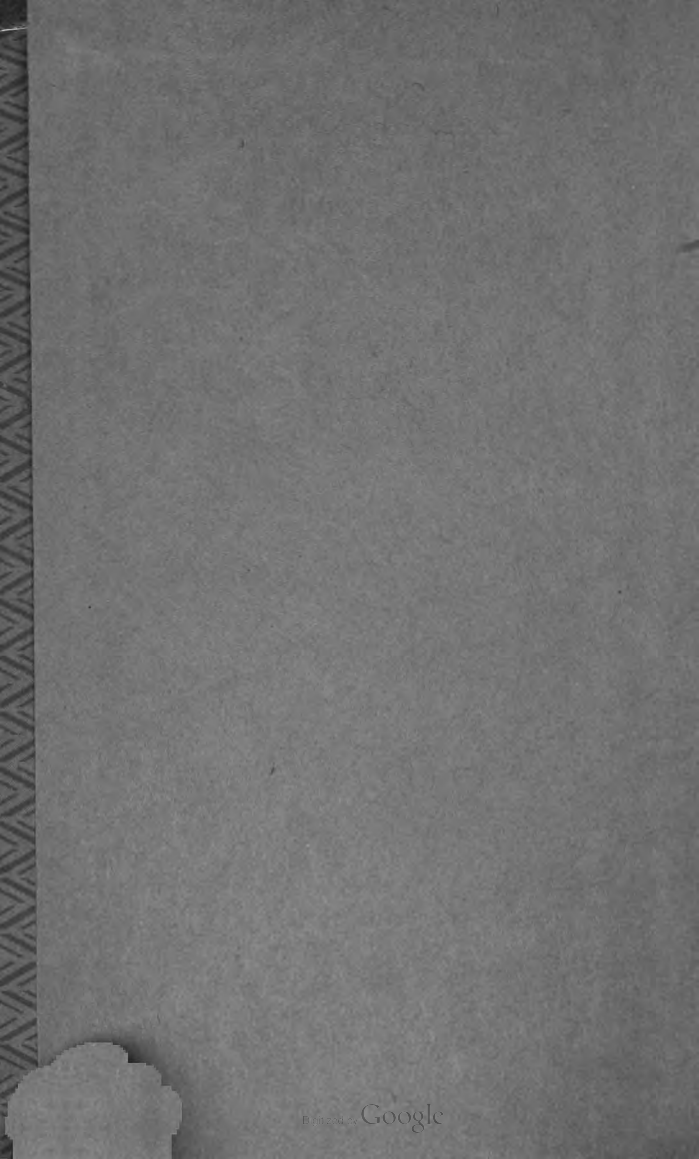
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**SMALL BOOKS ON GREAT SUBJECTS.**

**EDITED BY A**

**FEW WELL-WISHERS TO KNOWLEDGE.**

**No. I.**





**PHILOSOPHICAL THEORIES**

**AND**

**PHILOSOPHICAL EXPERIENCE.**

**BY A. PARIAH.**

*A. E.*

*Caroline Frances Cornwell*

**FROM THE SECOND LONDON EDITION.**



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## ADVERTISEMENT TO THE SECOND EDITION.

WHEN the Pariah first published his lucubrations to the world, he scarcely expected that they would meet with so favorable a reception as to call for a second edition: in this, it appears, he had deceived himself; and he now sends his "small book" to the press a second time, with the gratified feeling that he has not labored altogether in vain. He does not, in the guise of writers on lesser subjects, return thanks to the public for its liberal patronage; for profit and fame were no part of his object; but he rejoices in the thought that he may perhaps have contributed somewhat towards the advance of that kingdom of Christ on earth, which has hitherto been the object of our wishes rather than our expectations.

The success of his small work seems to indicate that many are beginning to feel the want of something which should teach them, not only the Christian faith,—for of such there are abundance,—but its rational grounds; something which by showing how deeply it is rooted in, and entwined with everything about and within us, may prove that the Framers of the world and its Lawgiver are the same; and thus lead them to the cross of the Redeemer, with the full conviction that the lesson to be learned there is no "cunningly devised fable," but that in truth "the wisdom of God" no less than "the power of God" was there manifested to the world.

This was the object which the writer proposed to himself when he first attempted to put into a porta-

ble form the result of many years' thought, and experience gained through suffering. Faith, without rational conviction, is but like the seed which fell in dry places; it withers when the hour of trial comes; for it has not rooted itself deeply enough in the mind to draw thence wholesome nourishment; and hence perhaps arises much of that "falling away" as it is technically termed, which occasionally scandalizes the world among professing Christians. The man, on the contrary, who has cleared and worked the soil beforehand, for the reception of the seed sown by the Divine Husbandman, is at least in a fair way of seeing it bear good fruit.

To handle the spade, and root up weeds, is a toil permitted, and indeed appropriated to the lowest caste in society, though to turn up the ground to make it ready for the heavenly seed, be a task which angels might be proud of. Humbly, and yet boldly, therefore, as becomes one of a despised and oppressed caste on a noble mission, he has addressed himself to his work; and, like a wiser and better man,\* has bent his knee to the Throne of all grace, and asked for a blessing on his attempt. If any success has attended his endeavors, he feels that it is to the sanctifying effect of such a prayer on his own mind that he owes it: may the reader, like the writer, gain, while turning up the soil, the treasure of a firm faith in Him who is **THE TRUTH AND THE LIFE**, and who is always found by those who seek Him.

And with this heartfelt good wish, kind reader, the writer takes his leave of thee for the present.

November 10, 1844.

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\* Joseph Mede.

## PHILOSOPHICAL THEORIES.

**THERE** was a time when none dared profane the name of philosophy by its mention, whose lips had not been touched with hallowed flame by Alma Mater, and who had not dozens of honorary letters following his name, like the tail of a Highland chieftain in olden days: but that time is past: men have at last discovered that the conferring a degree does not always confer sense, and that among the undignified names which go with neither a footman behind, nor a coachman before them, there may be found some who have a nobility of their own; and who, amid disadvantages and difficulties, have contrived to assert their right to the peerage of Intellect.

The writer of this work, as the title-page shows, is below even this; he is a Pariah, of a despised caste; unthought of even when the ten pounds householders of Stroud or Tamworth have the honor of hearing speeches from, and asking questions of, the great men who in this country are seized with a periodical fit of humility about once in four or five years. He has no pretensions to academical honors, lectures to no institution, is no hereditary legislator, no limb of representative wisdom: but he has known poverty, sickness, and sorrow; he has bent over the graves of those he loved, and turned again to life to struggle for his own existence, and in this rude school he has learned a lesson which, perhaps, may be not unuseful to his fellow-creatures; he has learned that happiness may be attained under circumstances which seem to forbid it; wrongs borne

patiently without losing dignity ; privations endured with a gay heart. The philosophy which has done this has made its last and best step,—it has become *practical*. It is no longer the barren speculation of the metaphysician, or the idle logic of the schools, but healthy intellectual science, grounded on the great facts of human nature, and available in all the circumstances of our varied existence.

There was a time too,—how much of late has sunk in the troubled ocean of human affairs even in the space of one not very long life !—there was a time when intellectual science under the name of metaphysics, was the mark for every witling to try his young jests on, sure of a favorable reception from the great body of his hearers. It is one of the singular facts of our social state, that there are always some few things which no one who pretends to enter good society ought to know ; and if all these *pet* ignorances had had their tombstones erected, and epitaphs duly written by their admirers, it would be hard to conceive a more amusing, though in truth melancholy record of human folly. In the days of Addison, no well-bred lady would venture to know how to spell ; in later times the prohibition only extended to any cultivation of the intellectual powers, which for a long time was most religiously attended to by all the fair votaries of fashion. In the days of Fielding, it would seem that a very pretty gentleman indeed, might gain a grace by misquoting Latin sufficiently to show that he despised the dull routine of school education. Later yet, a mineralogist or a botanist walked a few inches higher, if he could avow himself ignorant of metaphysics, and make some clever jest on the cobweb speculations of its admirers ; and all, learned or ignorant, wise or foolish, still unite in thinking it the properest thing in

the world to be totally ignorant of the properties of drugs, or their effect on the human body. True it is that a healthy mind in a healthy body is a thing worth having; a few deny that: and intellectual and medical science may do somewhat towards the preservation of both; this is also allowed: but to attempt to *know* anything about the matter is really too fatiguing for polished people, who can afford to pay tutors and physicians. But the writer is a Pariah, and having said thus much, he need hardly assure his readers, if any of that so-named "gentle" race ever take up these pages, that he never was great, or fashionable, or scientific enough, to have a pet of this kind: it would have been a troublesome, sometimes an expensive, always a disagreeable companion, a great hindrance to all rational employment, and no help to one who not unfrequently has found his wits his best heritage.

If such an one cannot afford to keep a pet ignorance, so neither can he afford to carry on abstract speculations which lead to no practical result: corporeal wants must be attended to; the difficulties of this life must be met and vanquished; and if in the midst of the struggles requisite to avoid being trodden under foot in the crowd, those great questions, which sooner or later occur to every reasonable mind, present themselves, it is not as curious contemplations, matters of philosophical research merely, which may occupy a portion of the time which is gliding away in the lap of ease and luxury, but as problems whose solution involves everything worth caring for in time or in eternity; problems whose due solution may gild a life which has no other gilding, may set fortune at defiance, direct our steps in difficulties, and like oil upon the waves, spread calm where all was turmoil and danger before: it is then



that intellectual science loses its character of barren speculation ; every step in advance raises us farther above the mists of earth ; and the heart warms, and the limbs grow strong, at seeing the prospect brightening in the distance, under the unclouded beams of truth and love.

It seems, nevertheless, to be necessary that science, as well as man, should pass through its different stages of growth ; at first, theoretic and fanciful, then abstruse, and finally, vigorous and practical. Astronomy has so proceeded ; many a small wit jested at the idle "star-gazing" of Flamsted and Halley as satisfactorily as the same genus has scoffed from age to age at the "unintelligible" reveries of Socrates, or any other seeker of the truth, from Pythagoras down to Dugald Stewart and Theodore Jouffroy ; but no small wit *now* tries to ground his fame on a successful scoff at "star-gazers ;" even Butler's "Elephant in the Moon" has followed the fate of the jests of lesser men, it is neither quoted, nor perhaps by the generality of the world remembered ; and the science which guides the mariner over an untracked ocean with all the assurance of a mapped country, sits enthroned in the affections no less than the respect of the present generation. It is time that metaphysical, or, as I would rather term it, intellectual science,\* should take a like place, for it has

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\* " Taken in its largest comprehension, as the knowledge of abstract and separate substances, Aristotle raises the philosophy of mind *above* all other parts of learning. He assigns to it the investigation of the principles and causes of things in general, and ranks it not only as superior, but also as prior in the order of Nature, to the whole of Arts and Sciences. But ' what is first to Nature is not first to Man. Nature begins with causes, which produce effects. Man begins with effects, and by them ascends to causes. Thus all human study and investigation proceed of necessity in the reverse of the natural order of things ; from

in its power to do a greater work than this: it can map the gulph between earth and heaven, and teach man, amid the conflicting opinions of the pilots who undertake to steer his bark, to choose and follow the straight course which will lead him over that untracked ocean in safety. The great men whose lives were spent in the pursuit of abstract truth, have left the results of their labors to us, and as the fanciful dreams of proportion in numbers, pushed at last to the exactness of mathematical science, have given us practical astronomy, so it is for us now to avail ourselves of the severe truth to which they have reduced the more imaginative Greek philosophy, and draw from it practical metaphysic.

Had any one else appeared inclined to undertake the task, the writer would willingly have left it in the hands of the learned and the illustrious in science; but no such attempt seems likely to be made, and as there are but too many of the Pariah race, who, like himself, may find that something more than the trite instruction of the school-room, or even the pul-

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sensible to intelligible, from body, the effect, to mind, which is both the first and final cause. Now physic being the name given by the Peripatetic to the philosophy of body, from this necessary course of human studies, some of his interpreters called that of mind, *Metaphysic των μετα τα φυσικα*, implying also by the term, that its subject being more sublime and difficult than any other, as relating to universals, the study of it would come most properly and successfully after that of physics. Taking it, however, in its natural order, as furnishing the general principles of all other parts of learning which descend from thence to the cultivation of particular subjects, Aristotle himself called this the First Philosophy; but as its subject is universal being, particularly mind, which is the highest and most universal, he gave it also the appellation of the Universal Science, common to all the rest; and lastly, to finish his encomium of this First and Universal philosophy, he honored it with the exclusive name of 'Wisdom.'—*Tatham's Chart and Scale of Truth*, vol. i. p. 17.

pit, is wanting to brace the mind to resist the rude buffets of the world, he at length steps forward, not as thinking himself wise, but as feeling himself experienced:—

—————“Nec nos via fallit euntes :  
Vidimus obscuris primam sub vallibus urbem  
Venatu assiduo, et totum cognovimus amnem.”

## INTRODUCTORY INQUIRIES.

**THERE** are some few important questions which have been constantly agitated from the earliest period that we have any record of man's history. The answers attempted have been various ; but none, as yet, have been so generally satisfactory as to prevent them from being agitated afresh by every new generation, for to every new generation they present themselves with a never-fading interest.

Man goes forth at his entrance into life, confident in powers which, to his youthful fancy, seem to know no limit ; he feels the happiness that his nature is capable of, and that it sighs for, and he rushes on to grasp and to enjoy it ; but he soon perceives that a power, exterior to himself, limits, and often thwarts his endeavors ; he finds himself at the mercy of circumstances which he can rarely guide, or at best only in a very slight degree ; and amid the anguish of disappointed hope he asks himself, "What is this power which I can neither control nor escape from ?"

But he is young ; he has probably expected to find his happiness in the pleasures of the senses ; and a voice within him says that these are gross, and unworthy of the god-like nature which he is conscious of possessing. He launches into the pursuits of the man ; forces himself to acquire science and greatness at the expense of exertions which exhaust his physical strength ; and then, when almost sinking under the fatigue of labors which, nevertheless, have not given him all that he sought, he asks himself again,

“What is this restless power within, which despises corporeal enjoyment, and triumphs in compelling the sacrifice of bodily comfort for an object which, after all, none attain?”

Insurmountable obstacles limit his progress; the perverseness of men thwarts his views for their benefit no less than his own; he looks round him in querulous displeasure, and again exclaims, “Why is evil in the world?” But old age now approaches, “his thoughts” must “perish” ere he has accomplished half that he has proposed to himself; he must “go hence and be no more seen,” before he has even attained the fruit of his labors; he seems to have “walked in a vain shadow, and disquieted himself in vain;” and then, when all that has filled his great aspirations seems shrinking from his grasp, when all appears “vanity and vexation of spirit,” he once more asks in a sort of concentrated despair, “Why man proposes ends to himself which he can never compass? What is the good which his nature demands, and how is it to be obtained? Is it sensual enjoyment? No! such pleasures pall on the senses, and end in disgust. Is it intellectual? The limited powers of men make the pursuit of science laborious, and death comes ere he has reached what he sought. Is it in the innocent enjoyments of social life? These are soon buried in the graves of those he loves.

These are the questions which every man not wholly brutalized must sooner or later ask himself. These are the questions, in fact, which have agitated mankind in all ages, and whose solution forms the basis of all systems of religion and philosophy. They all may be resolved into three; namely,

1. What is the nature of the power exterior to ourselves?

2. What is the nature of the power within ourselves?

3. What, with reference to these two, is the nature of the good which man ought to propose to himself as his aim and object?

The solution of the first two questions forms the subject of all metaphysical, or in other words, intellectual science. That of the third gives the practical result. Systems of religion decide these questions authoritatively, systems of philosophy solve them by rational argument, and as, however numerous these systems may be, there can be but ONE TRUTH, so we are justified in assuming that the religious and the philosophical system must tally, or that one or the other is in error. There is, however, this difference between the two, viz., that the authoritative system is necessarily delivered in the form of dogmata to be received, not of arguments to be tried and weighed; and these dogmata are couched in words which, as no previous course of reasoning is recorded, are liable to be misinterpreted by the prejudices of mankind. The philosophical system, on the contrary, is obliged to prove its assertions step by step; and if an undue leaning to any preconceived notion should lead to the adoption of a weak argument, the first dispassionate man who goes over the same ground will perceive and overthrow it: thus, though in the case of sufficiency of external evidence to prove the pretensions of the first to be well grounded, it is the shorter process, and therefore most acceptable to man's indolence; yet the second is the more certain one. To be completely satisfactory, the two should be joined together; but though occasionally a voice has been raised to call for this auspicious union, unfortunately for the world, the guardians of the former have gene-

rally held her to be too rich a bride to be bestowed on a mate who had no better inheritance than Socrates' old cloak and worn sandals, and have "forbidden the banns." The consequences have been disastrous: philosophy, like a wild youth, has run through a course of licentiousness; and religion, like a wealthy heiress, has become the prey of designing men. It is, perhaps, not too late to rescue both. Let us then begin with philosophy, whose morals—whatever they might have been while he was Socrates' pupil—have in later times been thought by no means faultless.

It would be a long, and, to a reader—a wearisome task, to go over all the disputes which have agitated the learned through so many centuries, as to moral perceptions, innate ideas, &c. He who would map a country must explore the by-roads; but he who uses the map, if he finds the road laid down lead to the place he wishes to arrive at, will not think it needful to traverse every lane on his way. It will suffice, therefore, to assume as an axiom,—what nobody, probably, will deny,—that truth is reality, namely, what really *is*; error an unfounded persuasion of something that is not. Now what is, must be either within or exterior to ourselves; and to know what is exterior to ourselves truly, that is, in its reality, we must examine it by the evidence of our senses, or by that of our reasoning faculties, or by both conjointly. There is no other process by which we can arrive at a certainty of knowledge. Thus, then, as an innate idea is one which must be received in the mind as truth without previous evidence, an innate idea of what is exterior to ourselves is a contradiction, and the common voice of mankind has decided on the point, by characterizing those who receive the per-

suasions of the imagination in the room of evidence as insane. Nor is the impressing itself on the mind without previous evidence the only necessary character of an innate idea; it must also be found in the minds of all mankind as a constituent part of their nature, otherwise it cannot be innate. It will soon be seen that there is only one idea which can answer to this description, namely, that of individuality, whose demonstration rests on that very individual consciousness, an evidence so unhesitatingly allowed by all mankind, that were any one to attempt to overthrow it by arguing that assertion is no proof, he might make good his position, and yet convince no one: for all feel that in order to assert individual existence it is requisite that a man should exist. But all impressions received by this individual consciousness are exterior to it, and consequently require to be examined; and thus intellectual science, like all others, becomes the subject of experiment and inquiry, and can only make progress by being classified and arranged so as to enable different individuals and succeeding generations to pursue and record their observations upon different portions of it. Even that part which Bacon himself hesitated to subject to the rules of his experimental philosophy, namely, religious knowledge, must submit to the same sort of examination: for from whatever quarter the authoritative dogma comes, it is presented to the senses from without, and cannot be received as authority, without sufficient evidence, both external and internal, to satisfy the mind of its truth; and as in classifying, the most natural arrangement is always the most intelligible, so the great questions which man's experience in life never fails to suggest to him, afford



at once the simplest and the best division of the subject.

I. What is the nature of the power exterior to ourselves ?

Man's first step, when this inquiry has suggested itself to his mind, is to look round on the objects amid which he moves, and which often appear to be the active agents in causing him either enjoyment or suffering. Does the power which controls him exist there? The untaught savage perhaps answers, yes, and selects his fetiche from the first thing that strikes his fancy. A little more cultivation sends him from the fetiche to something less tangible, and of greater apparent energy, and the heavenly bodies are adored; but when the question occurs in an age of more advancement, a very different process must be resorted to, in order to satisfy a mind accustomed to the severity of demonstration required by real science. We perceive an universe whose slightest movement we are unable to regulate; after ages of thought and observation, we think it our glory that we have arrived at the discovery of the laws by which it coheres; but they are so totally beyond our power to alter, that we can only hope to effect our purpose by shaping it in conformity to them. We have subjected these laws to the strictest examination; we cannot doubt that we have arrived at the truth, but these immutable laws provide only for the regular movement of inert matter. We look round again; we are surrounded by organized bodies, and we have not yet discovered the law by which they exist. We converse with our fellows, and find something beyond organized life merely; we find intellect, that subtle agent by which our inquiries are carried on, itself offering a problem of no small difficulty. The con-

clusion from all this,—ascending by a legitimate process of induction, from what we see and hear to what we cannot discern by any of our external senses, and can only apprehend by means of our reasoning faculties,—is, that some power must exist capable of giving birth to all this ; and as “*ex nihilo nihil fit*,” had there ever been a time when there was nothing, there never could have been a beginning of existence, therefore that power must be eternal ; and as there is nothing but inorganized matter that bears a character of permanency ; and the notion of an eternal series is an absurdity ; so to produce organized and intelligent beings, that eternal power must be intelligent. How much superior the creating intelligence must be to that created, the man who has constructed a steam-engine may guess ; for he knows at what an inconceivable distance in the scale of being he stands from the machine he has put together.

The power exterior to ourselves, then, is eternal and intelligent, and what is eternal, is of necessity self-existent. Now it is a necessary consequence of self-existence that such a being must be unlimited both in power and knowledge ; for as he himself exists by his own will, therefore his own nature, no less than all other natures existing by his will, must be perfectly known to him, and entirely under his control, and what is unlimited must be One ; for to suppose a second eternal principle would be to suppose a second individual will and purpose, which must produce a constant warfare, and would derange all the operations of nature, whose laws, on the contrary, we find to be immutable. For an incorporeal being can have no individuality but in will and purpose, and if the will be one, then there is an amalgamation of nature. Thus by a legitimate course of reasoning, we arrive at the certainty of one eternal,

self-existent, all-wise, and all-powerful Being, whom our simple ancestors, with a degree of philosophical accuracy which no other nation seems to have reached, named γοδ, *i. e.* good, for to such a being alone could the perfection belong which justly deserves that appellation.

But we have not even yet exhausted the consequences of this chain of reasoning; for the all-wise and all-powerful Being must be able to effect his will, whatever it may be. We may again look round us, and judge from what we see, what that will is. We see a profusion of means to convey pleasure; a profusion of creatures seemingly made to enjoy it, especially among the lower grades of organized beings. We have already proved that the eternal Intelligence can effect his will, whatever it be; then if that will were malevolent, we should see and feel nothing but destruction and misery; but we do not see it; then that will is not malevolent.

But the sad questioner who began the inquiry as to the nature of this eternal power, may perhaps again inquire, "If the will of the Creator be benevolent, why am I controlled in my wishes, limited to a life which is too short for my projects, and often made miserable during that short life by sickness or by the loss of what I had centred my whole joy in?" But who has assured you that these few years elapsing between the cradle and the tomb are all? The will of the eternal Being is not malevolent, beings of a far lower grade fulfil the end of their being and are happy; you aspire to something which the short span of life never gives. Is it not a proof that your nature is not bounded by that span? Turn then to the next question, for it is now time to do so.

II. What is the nature of the power within ourselves?

Our only way of investigating an intangible and invisible power is by its effects; we can, therefore, only judge of what the power within ourselves is, by noting the phenomena of human nature; these on a little consideration, will be found to resolve themselves into three classes.

1. The instinctive emotions and appetites, all arising involuntarily, attended with a sensible bodily effect, and causing derangement of bodily health when in excess; anger, fear, &c., all take their place among these.

2. The faculties; which are exercised by choice, but suffer fatigue in the exercise, require rest, and exhibit other symptoms of their animal origin, but nevertheless slumber, if not called into activity by a voluntary act.

3. The acts of a restless undivided will, which requires no repose, suffers no fatigue; is as strong in the child or the dotard, as in the mature man; which claims for itself the whole individuality of existence, and speaks of *my* body, *my* faculties, but never seems to have the most distant conception that this body or these faculties are identical with itself.

It is quite clear that neither of the two first classes of phenomena can be referred to that power within whose nature we are seeking to ascertain, for this often curbs and contradicts the instinctive emotions, and impels the faculties to continued exertion, when weariness, and pain even, show how much they need repose. Animal nature does not seek to destroy itself knowingly, but man knows that his life is the forfeit of a particular course of action, and yet he pursues it: then the impelling power is of a different nature from the powers which it impels. It is this impelling individual will, then, or "personal power,"

(as it has been aptly termed by a philosopher\* whose works deserve to be more known than they are,) that must form the subject of our inquiry; for on its real nature depends the answer to the last question, as to what the good is which man has to seek, and what are the means to obtain that good.

The first indication of this power is seen in the infant angry at its own helplessness, and evincing its discontent by passionate struggles and cries. The individual will has come into a scene which it does not understand, has organs which are insufficient for its desires, and in mere wayward spite, beats the nurse for not comprehending what is the matter. Watch the growing child; questions, curious observations, obstinate persistence in its own views, show a power which is rather seeking information for its own guidance, than by any means partaking in the immaturity of the childish bodily form. Stronger beings have a will also, which they enforce by the infliction of punishment; the child resists till pain teaches him to choose the lesser evil, and the point is yielded just when pain or privation has reached the point of being more irksome than the concession demanded; † this concession very generally being not

\* Theodore Jouffroy. "Mélanges Philosophiques—Des facultés de l'âme humaine."

† It may be objected by some, that the higher animals exhibit some traces of this independent will; but before this objection be allowed weight, it ought to be considered that there is an animal will, the result of mere organization; the impulse of sensation mechanically propagated through the nerves and brain, until the nerves of voluntary motion in their turn receive and propagate the excitement to the muscles; which is, in fact, the whole mystery of instinct. It will be difficult to show that in animals anything more than this instinctive will is ever discovered, but even supposing there were, let the argument have its weight; it might go to prove, perhaps, that the occasional sufferings of the animal creation are parts of a system not yet

the sacrifice of any instinctive desire, but some endeavor at independence in a thing which is itself of little consequence. The child arrives at maturity, and a fresh struggle for freedom commences. Life is thrown away as mere dust, to cast off slavery or preserve free institutions, for man has discovered practically that his nature only arrives at its highest point in a state of rational independence. Old age and sickness supervene; does this restless power, then, yield to circumstances? No. Impatience at the failure of the organs which have been wont to do its bidding, is the usual concomitant of these, and if we do not find impatience, it is only because it is curbed by the knowledge which the imperious spirit has at last gained, that this worn and enfeebled body is not its home, and that brighter days are approaching. When Maskelyne, amid the wreck caused by old age and palsy, blessed the child that sought him with affection, and could only utter "great man once,"—was the personal power less strong? Those few words showed what he would again have done, had he but had the organs requisite for the work. In sleep even, this voluntary power slumbers not; it resigns the reins, indeed, for a time, on the repeated petition of eyes, limbs, and brain, all declaring that they can do no more; but it remains on the watch

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fully developed, but it alters not the case as regards man, for we cannot argue from unknown premises; and before we can draw any deduction from animal nature to apply to our own, we must know much more about it than we do. The pride of man has disclaimed the fellowship of the animal creation, but we should be puzzled to find any sufficient proof one way or the other; let us then be contented to leave this matter where we found it, and argue only from what we know, satisfied that man will suffer no deterioration, even if

"in that distant sky  
His faithful dog should bear him company."

to use whip and spur again the moment it finds its servants capable of action. If any one doubt this, let him only strongly resolve, at going to sleep, to wake at a particular hour or a particular sound; and without any other known cause than the will, behold the man wakes, though, in any other case, he would have slept to a much later hour, or continued asleep through much louder sounds. This is a thing of too common occurrence to require particular instances to be given. Finally, in death itself, the last symptom of life that we see, is usually an ineffectual effort to do or say something which the dying person evidently thinks of importance; disappointment at being unable to do it, is visible, and the man dies.

We have traced the body from helplessness to death; it varies in its powers: first some instincts prevail, then others; then the faculties are developed, and then they fail. We can easily conceive that this waxing and waning power may return to its elements and be recompounded in a fresh form: but the unchanged individuality, which neither grows nor decays, how is this to perish? What seeds of mortality can we find in that? The anatomist traces nerves of sensation, influencing in their turn the nerves of voluntary action, and shows a beautiful arrangement thus made for the preservation of the animal; but the individual power steps in, says to sensation, "You may stimulate the nerves of voluntary action, but I forbid it;" and to the nerves of voluntary action, "You shall not wait for the stimulus of sensation; I command, and you shall do my bidding." In what part of bodily organization then is this power seated? The philosophical seeker of the truth must answer. It is not a part of bodily organization: it shares not in the growth or decay of the body; then by analogy, neither does it share

in its death;\* it sighs for other joys, despises what the body offers, spurns at the limited span of life. What is this but an indication of its destiny? Happiness consists in the full development of all the powers of Nature: no animal seeks that which it is unable to enjoy—the fish remains quiet in the water without seeking to quit it to share the pleasures of the quadruped or the fowl. Man sighs for the felicity of the deity; then man is of a kindred nature. We proceed therefore to the final question.

III. What, with reference to the two powers already treated of, is the nature of the good which man ought to propose to himself as his aim and object?

Our inquiry here will not be long. Whatever other orders of intelligent beings there may be, there are only two that we can form any judgment of:—The One, the subject of our first, the other that of our second question. We assume it as an axiom in philosophy that the felicity of the being must consist in the full development of its natural powers,

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\* In proportion as science advances, the great truths of Christianity stand forth in a clearer light. In former times the life and the soul were considered as identical, and many a puzzling question arose out of this mistake. Now, physiology has shown that the vital power, inscrutable as its nature has hitherto been found, is nevertheless the same in the animal and the vegetable; consequently that life is not dependent on the soul, but is a perfectly distinct force, acting by its own peculiar laws. But though the soul and the life be different, still the former is an acting force which the physiologist is obliged to acknowledge; for it not unfrequently contends with the vital force, and occasions much disturbance in the system. One of the most distinguished scientific writers of the present age, when treating of organism, distinctly reckons this disturbing force among the different independent causes of the phenomena of man's being. Thus it is that science and religion, the two great inscriptions on God's fabric of creation, always tell the same tale, though it be written in different characters.



and we see this to be the case with all the inferior grades of animals; we turn to man, and we see that the development of his *animal* powers does not satisfy him, he asks for more; he asks for knowledge, greatness, immortality, and these are the felicities of the Deity; then, the good which he has to seek can be none other than the development of an intelligent, and not an animal nature. We have already seen that the individuality is concentrated in that interior power whose nature we have been examining; that interior power is akin to the Deity: then the felicity of the Deity in kind, though not in degree, may be his, and no rational man will propose to himself any other.

Such are the conclusions of philosophy, such were its conclusions from the time when these questions were first agitated, and wise and good men, long before our era, had suffered exile, imprisonment and death, rather than abstain from promulgating these great truths. Who now will dare to stand forward and say that there is any "just cause or impediment" why philosophy and Christianity should not plight their troth to each other, and bless the world henceforward by their holy union? Once more, "I publish the banns," and defy man to put asunder those whom God has willed should be joined together. "Fecisti nos tibi et manet cor irrequietum donec restat in te,"\* was the sentiment of Augustine, "Ex vita ita discedo tanquam ex hospitio non tanquam ex domo," says Cicero in the character of Cato, "O præclarum diem cum ad illum divinum animorum concilium, cætumque proficiscar; cum-

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\* "Thou hast made us for thyself, and the heart is unquiet till it rests in Thee."

que ex hac turbâ et colluvione discedam !”\* Where is the difference between the philosopher and the Christian ?

I have now gone over the general outline of the classification which I propose to make of intellectual science. I have, I think, proved in answer to the first question that there exists an eternal self-existent, creating Intelligence ; all-wise, all-powerful, and benevolent ; and the portion of intellectual science which treats of this Being I propose to call *Theology*.†

I have, I think, proved in answer to the second question, that the individuality of man consists in a restless, undying intelligence, akin in its nature to that of the Deity ; and I propose to call the portion of intellectual science which relates to the functions of this intelligent, individual power, *Psychology*.

I have drawn as a conclusion in answer to the third question, That such being the nature of that individual power, the good it has to seek is, assimi-

\* “ O what a delightful day will it be when I shall join that company of divine souls—when I shall quit this throng and this mire !”

† The term *Theology* has been so long applied to a peculiar department of literature that the meaning of the word is in great measure forgotten. I reclaim for it the original sense ; for as *Conchology* means the science which tells of the nature of shells, or *Geology* that which tells of the nature of the earth, so *Theology* in strictness means the science which tells of the nature of God ; and it is misapplied when used to classify works which mix up the moral duties and the prospects of man, with the abstract science of the Divine Essence. The word would be novel, but it would aid us to define the limits and objects of the science much better, if we were to include all that relates to the mission of Christ to man, and the obligations therefrom resulting, under the general term *Christology*.

lation to the Deity in will and kind of felicity. The titles given to this part of the science have been various. Some have called it *Morality*, some *Religion*; but as unfortunately these two terms have been set up as rivals to each other, neither conveys the exact meaning to men's minds which I would wish. It would be easy to coin another Greek compound, and *Agathology* would not ill express that part of the science which relates to the nature of this "summum bonum" and the means of attaining it; but for a plain man a plain word is better, and I would rather head the last division as the practical result of the two former. In what I have to say further, I shall consider these divisions as applicable no less to the authoritative, than the philosophic system. The external evidence of the former I take for granted; Christianity must have had an origin, and it is far less outrage to common sense to suppose its outset was such as its first promulgators assert, than to allegorize Christ and his apostles into the sun and the signs of the zodiac, or anything else as strange and as improbable. The existence of Christianity is too notorious to be denied; and if, as a system, it offers all that man's best reason has been able to discover, if it offer as a perfect whole, comprehensible to the meanest capacity, what no single man, however great, quite accomplished, then it is no imposture, it is **THE TRUTH**; that truth which Socrates died for, and which armed Cicero's timid nature to meet his assassins with the courage of a hero. It is in vain that we attempt to reject it; the man who professes to cast aside Revelation altogether, still, if he be not a vicious man, lives as a Christian, has a Christian's benevolence; a Christian's hopes; it is in his nature; his instincts oblige him to love his fellows; his faculties compel him to

acknowledge a First Cause; his dearest wish is immortality: Christianity comes but to second the dictates of his better self, and to give a sanction to his hopes; but with this advantage, that he whose mind has not been enough cultivated to reason out a foundation for these hopes, or to argue man's duties from his nature, finds plain precepts for his guidance which embody all and somewhat more than philosophy could have taught him:—if this system be not divine, at any rate had the Deity given a revelation to man, he could have given no other.

It will be my endeavor not to show how the one truth which forms the centre of both the authoritative and philosophical systems will be reflected back from each in turn, so as to throw light upon the other; and if, in so doing, I may set at rest some few of the angry feelings which are too apt to prevail on subjects where they are the most misplaced, if but one heart should learn to feel with me that where all are eagerly looking for the truth, that circumstance ought to make us rather friends than enemies, and that the path we take matters far less than the place we are going too;—I shall have at least one cheering thought to go with me to my grave, brightening my path as all else grows darker.

## THEOLOGY.

ONE of the most fruitful sources of angry discussions on this subject on the one hand, and idle scoffs on the other, has been the disposition so prevalent among men, to a species of Anthropomorphism in their notions of the Deity; for though all will not go the length of the Egyptian monks who nearly murdered their bishop for endeavoring to persuade them that God had not actual hands and feet,—as they alleged they found written in the Scripture,—yet many would go nearly that length with him who should dare to assert that God has no more of the vindictive passions than of the bodily form of a man. Yet we must see clearly that one is nearly as absurd a fancy as the other, if we consider that a pure spiritual existence has no individuality but in will, and purpose, and feeling; and that therefore any of those changes in mood which are in truth a part of the *animal* nature of man would be equivalent to a change of individuality in the Deity; for a change of purpose is a change of person, where there is no animal nature to create or suffer that change. Philosophy asserts this, so does Christianity; in God “is no variableness, neither shadow of turning,” yet men in all ages have misapprehended a few eastern hyperboles in the language of the Scripture, till they have made a Deity for themselves such as we should not select, even for a human friend. “I defy you to say so hard a thing of the devil,” said John Wesley, when speaking of Whitfield’s doctrine of Reprobation; yet

Wesley was not free from the prevailing anthropomorphism himself.

The very first step, then, if we would wish either to understand what is predicated of the Deity in our Scriptures, or to know how we ourselves stand with regard to this exterior power, whose will evidently must control us something in the same way that the parent controls the child, is, to ascertain what are the necessary conditions of eternity and self-existence, for it is in vain to say that the Deity is utterly beyond the reach of our reasoning faculties. We can conceive eternity, we can conceive self-existence; every strong and cultivated mind that has turned its attention to these subjects knows this; though it is one of those parts of individual consciousness which admits no other proof than the feeling that we can. We can conceive,—that is, though unable to comprehend, (using the word in its sense of the entire grasping of a subject,) we can apprehend, or reach to and lay hold on, the great features of the case:—we can arrive in thought at an approximation to the nature of an immaterial existence, though we cannot fathom all its depths; and that we can do so is perhaps one of the strongest, though least conspicuous proofs that we have a sort of imperfect specimen within us of what immaterial existence is; for experience shows that man is unable to conceive what he has no exemplar of. The wildest imagination, while endeavoring to form a monster, has never done more than take disjointed parts of known things, and put them together. The essence of eternity and of self-existence is, that it is boundless, for, as I have already observed, if we suppose any other like power, we must either suppose a difference, or an agreement of individual will and purpose; if a difference, then

there must be discord and destruction : if agreement, then, as there are no bodily parts to prevent entire union, there is an amalgamation, and the power is one ; one, in its individuality, that is,—but—as some ancient Christian philosophers have well observed, —not necessarily one in its parts or functions, since the individuality, the wisdom,\* and the actively exerted will, are distinct principles appertaining to the same essence : for it is clear that the individuality might exist for ever without any active exertion, yet the power of exertion is in it, and capable of being manifested at any time ; and though the individuality, the wisdom, and the exerted will, are distinct parts or functions of the one self-existent Being, they are necessary consequences of each other, and being each perfect, can be susceptible of no change ; for the knowledge which directs the will being entire, the choice consequent upon it must be always the same ; nor can there be any other essential part or function affirmed of the eternal self-existent Being than these three : all the rest must be mere negatives consequent on them. Thus God cannot be mistaken in the means to an end, or find his purpose changed by unexpected circumstances ; because perfect knowledge forbids both. Nor can God suffer pain or grief, because either the one or the other results from the action of some force, exterior and superior to the being so suffering ; a thing which perfect power equally forbids.

Again, there can be no distinction of past or future with the Deity. Man measures time by the revolu-

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\* The mere English reader is not aware, and even some scholars scarcely consider that the term *λογος*, which in the Gospel of St. John is translated "Word," has the meaning in the Greek of the "Reasoning Power," or "Wisdom in active operation."

tions of the earth, and by his own waxing and waning powers. Give him an eternal day and an unaltered body, what then will be his past and future? The past is what he has done and knows, the future what he has not yet done, and therefore does not know: but the Deity knows all, where then is his distinction of time? To him it is one unbounded present, and all the events of the world, no less than its component parts, lie spread before him as in a map; save that our map only represents material objects, whereas it is the mind of man which the Deity looks through,—sees the motives which operate there, and bends the events of nature so far to control the actions resulting from them, as to make even evil intentions conducive to some good end. It is an earthly and a human notion which figures to itself the Deity arranging the affairs of the world by patching here, and mending there, as if any event could take the Creator by surprise. And here arises the question which has been repeated through all ages, “Why, then, is there evil? Why is there suffering in the world?” for if an all-powerful Deity sees and permits, it is equivalent to the causing it. Even in human law, the man who stands by and sees a murder committed, without endeavoring to prevent it, is held a party to the crime.

The answer to this is to be found in the nature of the beings in question. There is one thing which even to the Deity is impossible. The self-existent cannot make another self-existent, and what is not self-existent is bounded; for there is an antecedent and a greater power: and what is bounded is imperfect; for there is something which it does not know, and therefore it can commit errors. Now experience shows us that there is no happiness but in voluntary action: minerals have chemical affinities



and combine necessarily, but there is no sensation of pleasure; the heart performs its functions involuntarily, and there is no sensation of pleasure in their performance; the goods of life as they are called, such as health, riches, &c., when in quiet possession, give no pleasure further than they afford the means of seeking it, which is voluntary action. To make a being capable of a high degree of happiness then, he must have a free and intelligent will; and thus he is akin to the Deity, and capable of tasting the same felicity. This necessarily imperfect being, therefore, has a complete freedom of choice, consequently the power of erring in his choice; what then would be the course pursued by unbounded benevolence to preserve him from error? Would it not hedge him round with difficulties at every step towards that wrong path; with inward discomfort, pain, and a long train of evil consequences to prevent him from pursuing it? Would it not school him, as a parent does his child, by allowing him to suffer from his thoughtlessness to make him wiser in future? An imperfect being might not know how to prize or to enjoy the Divine felicity, till taught its worth by having tried in other directions and found himself wrong. Is there then actual evil in the world if we except that of the perverse will of man? I think a short consideration will show that there is not. I think that there is no man who has attained middle age, who will not acknowledge that in the irremediable events of his life there has always been either a grief avoided, or a good to be gained, if he chose to lay hold on it. A friend, the beloved above all others, dies perhaps; is it long before we can see cause to thank heaven that he is safe from the evil which he would otherwise have had to endure from evil men? His death

has changed all our views and aims ;—do we not find that in this change of views and aims we have gained more than an equivalent for what we have, after all, lost but for a time? We have gained probably a farther power of doing good ; have formed fresh connections over whom we may exercise a beneficial influence ; are becoming more capable of intellectual happiness ourselves, and of leading others to enjoy it ; more assimilated to God, and more fitted for a joyful reunion with those whom He has taken to Himself. If our conclusion as to the real nature of man be just, (and I know not how we are to avoid acknowledging it to be so), then what passes in the short span of bodily existence is but one part of a great whole ; and in passing through that state which is the school of our intellectual nature, enjoying pleasure while pursuing the right course, and suffering pain when following the wrong one, we are only undergoing a necessary preparation for a higher degree of happiness ; after which, having gained the experience necessary to enable us to choose aright, we may find in the bosom of the Divinity and in the society of others perfected like ourselves, the entire felicity which we have sighed for.

Thus far philosophy speaks. Christianity goes further, though in the same tone. Christianity says, “Man’s path, even though thus fenced, may be mistaken,” and it proceeds to offer a set of precepts which make that path still plainer ; it offers more yet, it sets before him an exemplar of human virtue, made perfect by the indwelling of the Deity, and by showing how lovely such a life might be, even with no circumstance of worldly grandeur or pleasure to recommend it, has brought every feeling of man’s heart into accord with his true interests. “Never

man spake like this man," "All were astonished at the gracious words which proceeded out of his mouth," &c., &c., sufficiently shows how that bright pattern of excellence laid hold on the minds of the most indifferent.

Nor is this all: we have already seen that the qualities of the Divine nature may be argued out by a sound philosophy. Man finds himself in a certain degree a partaker of that nature, therefore, by the necessary law of all existence, his happiness must be of the same kind; and to seek any other would be but the insanity of a man who should plunge into the arctic seas to follow the whale. If, then, convinced of this truth, he schools his mind to wish what the Deity wills; to seek, in short, the same felicity, he will no longer have to complain of his finite nature; for Infinite Power is already accomplishing his wish, almost before he has known how to shape it. He has no dread that the attainment of his object will be defeated; for he knows that if the scheme he has devised prove vain, it is only because it was not in reality calculated to promote the end he had in view, and his inmost heart thus becomes a spring of never-failing content and satisfaction, a well of living water, freshening and beautifying all around as well as all within.

None who have not tried, are aware of the large influence which a soul thus constituted has, even upon the bodily health, though physicians have not unfrequently observed that a quiet and happy mind is the best medicine in illness. Sickness is one of those evils which are thought the immediate infliction of the Deity, though were the matter better considered, it would appear that it is most generally of man's making; but even when thus produced, it may become a blessing instead of a misfortune, by

steadily pursuing the same course. If in health, we can imitate the perfections and seek the felicity of the Deity, by diffusing happiness around us, and enjoying the contemplation of it; in sickness we may seek the knowledge which forms another part of His attributes. It is a false notion that application of the mind to science is impossible or hurtful, in such a state; on the contrary, it takes off the tedium of confinement, withdraws the attention from pain, and makes what would otherwise be wearisome, a source of enjoyment; for those who have active duties to fulfill, often have scanty leisure for acquiring what nevertheless they sigh for. In the quiet of a sick chamber knowledge may be sought and yet no duty neglected; and with convalescence comes the additional pleasure of feeling that we go forth to our duties with a mind strengthened by its high contemplations, and with increased powers of usefulness from the acquisition of knowledge. This is no imaginary picture; if the philosophy which the writer now presents to those who, like him, need it for practical use, be worth anything, let him who profits by it remember that it was so acquired. It was during months of illness that he stole time to hold intercourse with the master-minds of antiquity; and often has he hailed, almost with delight, the respite thus afforded him from worldly toil. If then, to an individual deeply involved in all the perplexities caused by man's perverse will, the mere schooling his wishes to the Divine similitude be productive of so much peace and happiness, what would be the consequence if a whole community were under the same influence? The question of "why evil is in the world?" would not then be asked; for there would be none. Health would not be worn out by extreme labor; for who that loved his neigh-

bor would require or allow it? Hearts would not be broken by unkindness; for the follower of such a system "loves his brother." Disease would not be brought on by excess, or transmitted in the blood to an unfortunate progeny; for men would no longer debase themselves by sensuality. Science would meet and control the dangers arising from natural causes; and death itself would be but a pleasant journey to a happier land, where friends and kindred were awaiting us. Again I repeat that the mass of suffering which man sternly mounts upon to arraign the Deity, is heaped up by himself only, and might be swept away again by the same hands that placed it there. Three generations of a wise and virtuous race would nearly efface the mischiefs of all the ages of sin and sorrow which had preceded them. There is nothing in all this, probably, that has not been said before, and perhaps better said; but unfortunately, the necessity of using words as the medium of thought frequently leads us to forget that they are only the medium and not the ideas themselves. Thus we find it daily repeated, that God is eternal, self-existent, almighty; and when these words are uttered it is thought sufficient. Among those who utter them, who is there who has accurately weighed the necessary conditions of such an existence? The most contradictory propositions are brought forward and insisted on, and none perceive the contradiction unless the very word should bear it upon its face. Thus, he who should assert that God is wise and ignorant, powerful and weak, at the same time, might be doubted; but he who asserts such changes of purpose in the Deity as we find resulting from the want of power or of knowledge in man, gains credit, because it is not perceived that omnipotence and omniscience leave no room for any such change,

and that eternity and self-existence entirely forbid the possibility of it: this is but one of the many propositions of this kind which daily pass current in the world. If, therefore, an accurate notion of the nature of the ruling power on whom we depend be requisite to the understanding our position, and regulating our actions, it is of no small importance to awaken men's minds to the logical consequences of their admitted creed. Indeed, were this course generally followed, there would be an end of the dissensions which now disgrace the Christian world; for a really false opinion would soon manifest itself to the mind of the inquirer by the absurdity of its consequences, and all other differences,—which arise merely from taking words for ideas and then imagining that our neighbor means differently, because he uses a different word,—would merge in the one truth which all love, and either seek, or think they have attained. I believe that if each of the words which have in turn been made the "Shibboleth" of a party, had been subjected to such a process, we might now be living in peace, "one fold, under one shepherd." Sure I am, that as the **THE TRUTH** can be but **ONE**, there must be a fault in the course pursued, or those who have honestly sought it could not have remained, as,—alas for Christian charity!—many wise, and otherwise good men have remained,—in bitter opposition to each other.

"The man is other and better than his belief," says Coleridge; so deep a thinker ought to have gone further, and told us why it is so; for the maxim is a true one. Is it not that the conviction of the heart, from which his actions flow, finds imperfect expression in words, and that even those words fail to convey to others the meaning he has intended to give them? His words are attacked, and he defends

them as the visible signs of what he thinks and feels; but are they so? Let any man try to express his own interior conviction in accurate terms, and see how many deep feelings of unseen realities, how many humble prostrations of human weakness before Divine perfection, are unsusceptible of any expression at all; and when he begins to attempt a definition, how his very soul groans over the unsuited tools he has to use; and when he has felt all this, let him, if he can, condemn his neighbor's creed, when he sees his neighbor's life, and reads in that what he must have intended to express.

We have now seen what are the necessary conditions of self-existence. Will either Unitarians or Trinitarians dissent from this? Athanasius, the most decided of Trinitarians, expressed himself in nearly the same terms that I have used. Priestly could hardly have wished for any other definition. Why then have they been considered of different sects? Because each has attacked or defended *words*; and the *things* which those words were intended to convey a notion of, have not been duly considered; and then, when controversy once begins, and passion enters where placid reasoning alone should find place, adieu to the hope of brotherly fellowship! Evil feelings are engendered; the church of Christ is split; and he who endeavors to make peace by showing each party that in the heat of dispute both have gone too far, is looked upon as lukewarm in the cause, or perhaps as a traitor to that very faith which he is endeavoring to preserve "in the bond of unity."

The tradition of the church tells us that when the apostle John, sinking under the pressure of years and infirmity, could no longer preach to his converts, he was wont to be carried in a chair into the midst of them, where he pronounced simply these words,

**“Children, love one another.”** If this was the last lesson of the disciple “whom Jesus loved,” of one who had heard the gracious words of Him who “spake as never man spake,” surely we shall do well to remember that “brotherly love” is orthodoxy, and that charitable indulgence, not unmeasured zeal, is “the fulfilling of the law.”



## PSYCHOLOGY.

IF Theology has been embarrassed by inadequate conceptions of the nature of the Self-Existent, Psychology has suffered no less from confined notions of the nature of man. Though it has been very generally believed that this nature is compound, and though the words "soul" and "body" are in every one's mouth, yet we find no distinct ideas respecting the functions of each, even among those who are the most decided in their assertion that such are the component parts of man. We find no great laws established by experimental proof, as in other sciences; no accurate classification; and he who, without a previously formed theory of his own to guide him through the labyrinth, should take up any of the works professedly written to explain the subject, would very probably find himself more bewildered when he had finished than when he began.

When a science is in this state of chaotic disorder, there is no chance of progress; the very first step towards its advancement, therefore, must be a classification which may at least reduce the subjects it embraces to something like arrangement. It may be imperfect, it may even be erroneous; but at any rate, the objects requiring attention will have been disentangled from each other, and so placed that they may be viewed separately, and examined on all sides; it is easy then to shift their position if, after such examination, it should appear necessary.

But the very thing which makes classification needful makes it also difficult. Whoever may attempt it will be met by his cotemporaries with the taunt, "What new sense has been given to you, that you imagine yourself able to do what abler minds have not accomplished?" Those who think that the adytum of the temple ought to be dark, or lighted only by the torch of the mystagogue for the entrance of the initiated, will denounce the endeavor to admit daylight as a sacrilege. What have the *people* to do in such matters? and what can a Pariah know of them? All this and more must be expected, but it alters not the case; a first step must be made, or a second never can be: and if the people, the multitude, the *οι πολλοι* (I care not by what term of contempt I and my compeers may be denominated), if the masses, I say, are to be what God made them to be, something more must be done than to tell them that they have instinctive feelings given them by a benevolent Deity, which it is a sin to indulge; for which reason severe laws abridge their gratification as far as possible: and that they have a soul destined for an immortality of spiritual enjoyment which they have no means given them of preparing for. Something more than this, I repeat, is needful to make us fit denizens of heaven: we must know how much of what we now feel is to go with us beyond the grave, how far it is to be controlled; how far indulged. We must, in short, ascertain the boundary line between the animal and the immortal nature; and this must be done, not for the *few* who have grown pale over their midnight studies, but for the *many*; for those who can only snatch a moment from the labors of the day for a short book, and whose toil has made them sleep too

soundly at night to allow of long speculations. The philosophy of the multitude must be as brief as it is practical.

We began with a slight classification of the phenomena of man's nature into

1. The instinctive emotions and appetites.
2. The faculties.
3. The will.

And I assumed that as the first two partook of the changes which the body undergoes, they were bodily; but that as the individual and intelligent will partakes of none of these changes, it was of a different nature. Had we never heard of soul and body, so marked a distinction in phenomena would have led us to look for a double principle to cause it; and I therefore propose to reduce man's nature to its ultimate elements, by arranging the whole under two simple divisions.

I. Material and animal functions subjected to bodily change, and subdivided into

1. Appetites.
2. Instinctive emotions.
3. Faculties.

II. Spiritual and unchanging functions.

The latter division only, is, strictly speaking, the province of Psychology: but in a nature so intimately blended, the one part so influences the other, that a system which should leave out either would be very imperfect. I therefore proceed to consider,

I. Material and animal functions subjected to bodily change.

1. I need not waste time in proving that appetites, such as hunger and the like, are a part of our bodily and animal nature. No one denies it; and whoever should doubt it might soon be convinced by trying

the experiment of preventing their gratification. Man would perish from the earth under such a regimen.

2. There has been more doubt as to what I here call the instinctive emotions: anger, fear, and many other emotions of this kind, have generally been termed passions, and referred to the soul for their origin; but when it is considered that they arise involuntarily in the first instance, and are attended with such a change in the circulation, and other bodily functions, as to disorder the health, and even in some instances to cause instant death, and when, moreover, it is considered that these so called passions are requisite to the preservation and well-being of the species,—for anger impels us to self-defence, fear to the avoidance of danger, &c.,—we shall be justified, I think, in giving them the appellation I have done; since, though passion, if we take it in the strict sense, means only a thing suffered *passively*; yet in common parlance it has been strangely confounded in its meaning, and is not unfrequently so used as to signify a thing done *actively*. Of course from this class of instinctive emotions must be rejected, some of the feelings hitherto classed among passions, such as Hope, which is attended with no bodily disorder, and has therefore no claim to the title of passion, or a thing suffered. It will not be necessary to specify every one of the emotions thus to be classed; it is so easy to examine whether any bodily disorder is ever occasioned by it, or not, that none can be at a loss in determining the question.

3. The faculties have been variously considered by different writers: but as a recapitulation of their opinions would take much space, those who wish to know what they are, must consult their works.

Pursuing the inquiry on the same ground that I have taken with respect to the instinctive emotions, I find clear indications of bodily origin, in the fatigue occasioned to the brain by their exercise, the necessity for repose ere they can again be set to work, their complete derangement by bodily disease, their debility in the last decrepitude of age. We need hardly ask the physiologist for his assistance here; common observation suffices for this conclusion. And here we may notice, that as the instinctive emotions are requisite for the preservation of the animal, so also are the faculties in a certain degree; for though the combinations effected in the brain may be applied to other purposes, which I shall presently speak of, yet the first and most obvious use is in the ministering to bodily needs;—contrivances for defence, for shelter, for procuring food, are the result of such combinations; and unarmed with natural covering or natural weapons as man is, it is evident that without these contrivances the species would soon perish. Thus far therefore we have a mere animal, with the properties and capacities requisite for his preservation.

## II. Spiritual or unchanging functions.

These appear to be two: *i. e.*, the intelligent will, and that species of memory which forms the consciousness of identity; and which,—however ordinary recollections may be impaired by the injury or disease of the brain,—never suffers any change from infancy to death, and even in sleep remains unaltered.

We have as yet considered man as an animal only, and have seen all parts of his frame acting harmoniously together; the appetites, and the involuntary or instinctive emotions by turns stimulating the faculties to provide for the needs of the body, these facul-

ties being operations of the brain, and therefore coming within reach of the mechanical action of the system. But another power now enters upon the scene, and, for good or for evil, not unfrequently thwarts and disorders the whole. The instinctive emotions, which in themselves are evanescent, are wrought up by this untiring energy into permanent affections. The faculties which naturally only act under the stimulus of bodily wants,—that is to say, under the impulses mechanically conveyed to the brain,—are now seized upon by this restless inquisitive power, and compelled, in spite of fatigue, and even utter derangement of health in consequence, to minister to its requisitions, and supply it with the information it wants; untired, unchanging, it drags on its weary slave with immitigable determination, till at last it scornfully casts it into the grave as no longer fit for its purpose, and asks for other worlds, and ages yet to come, to satisfy its impatient longings for wisdom or for enjoyment. But though, when speaking of functions, I have divided them into two, as manifesting themselves differently; it is clear that they proceed from one principle; it is the conscious individual essence which pours itself forth in this energetic and unwearied activity, and is able, when it knows its powers, to appropriate to its own purposes the whole of the unrivaled machinery placed within its reach.

But though this nice mechanism be capable of responding to the touch of that power within, which makes man so godlike when his nature has its full play; it is too frequently left at the mercy of outward impressions, and remains the mere animal to the last: for we have already seen that the exertion of the intelligent will over the bodily functions is not requisite to their performance so as to preserve life.

Man may exist as an animal, or at least very little removed from that state, and when the brain has never been exercised in those nicer operations which the individual essence can at its choice require from it, it becomes as unfit for use as the hands of a Hindoo devotee when he has resolutely kept them shut for ten years together. Active use is the necessary condition for keeping any bodily fibre in a healthy and serviceable state; and we see that this active use is stimulated by the sensations from without, which at our first entrance into the world are so abundant in all directions. The first impulse of the child is a restless curiosity, and at the same time an endeavor to combine and arrange ideas from what he sees and hears. Sensation has done its work; the brain has perceived; the individual is beginning to discover the organ he has at his command, and he is already directing it to the inquiries needful for his information; but too frequently the child has no one who can reply to his inquiries; he gets weary of useless question, or is reproved for it; the brain consequently becomes inactive as to all its higher functions, and no farther progress is made. The will is either not exerted at all,—for the mere action of nerves of voluntary motion stimulated by sensation must not be confounded with the ruling individual will,—or if it be exerted, having no longer power over the faculties so as to acquire useful information, its whole energy is devoted to the giving force and permanence to the instinctive emotions, which being involuntary, never can slumber as the faculties are wont to do. The man becomes thus the creature of passion, and that immaterial essence which should have been the guide to all that is excellent and noble in knowledge and in feeling, panders only to the impulses of the body, and degrades

itself from its high dignity merely to sink both below the level of the brute; for the brute, when the appetite is satisfied, goes no farther; but bring the intelligent will once to aid, and the jaded appetite is pampered and stimulated; fresh excitement is sought, and the body is at last worn out by the endeavors of its unwearied ally to minister to its gratification.

In cases of idiocy it is evident that the brain never has attained a sufficient power for supplying the individual will with the information it needs; but the proverbial obstinacy of idiotic persons shows that this power is as strong in them as in others; and were a careful training given to such children, it would be found that they are capable of much more than is supposed.\* I knew a family in humble life, some years ago, where three of the children were thus afflicted; two of them were trained as persons in that rank usually are, to labor, and attend the church on Sunday. The third, and youngest, was the mother's darling, and nothing was required of him. The first two remained weak in intellect, but capable of performing many manual labors; were honest and industrious in their way, and were conscientious in the discharge of their humble duties. The third was the reckless, spiteful idiot too often seen.

Again, in insanity we find a no less resolute will; but misled by the false report of the brain, it is devoted to useless or mischievous purposes; and here too it is probable, that were the office of the brain, of the instinctive emotions, and of the ruling will, duly distinguished, this most miserable of all calamities might be either wholly averted, or greatly mitigated. Its origin is either in a diseased state of the

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\* See "Small Books," &c., No. 3, § 14.



brain, from injury, or the violent action of some instinctive emotion, or a devotion of the cerebral power to one subject exclusively of all others, till it has no longer the power to apply to any but that. Now were the ruling will in the habit of claiming that supremacy which it *can* claim, it seems probable that in every one of these instances it might, if not prevent the evil wholly,—as it probably would in the two latter,—yet greatly mitigate it. Else how is it that we find in cases of confirmed insanity the fear of pain will curb the fit? Here the will is excited to use its power to avoid an evil, and for the time it uses it successfully.

Few know or believe the immense power which this undying energy is capable of exercising over the body, for it is only now and then that it is seen in full action; but that it is both master of, and widely different from the animal nature, may be sufficiently shown from those instances. For example, when a man resolves on putting an end to his existence by abstaining from food,—and this has been done,—the tyrannical sway exercised over every sensation and craving of the body, is complete and durable, as well as in entire contradiction to every impulse of the animal nature. Or if it be said that this has been merely the last resort of a man wearied out with suffering, let us take the case of one hazarding or throwing away his own life to save another from perishing. A stranger it may be, one from whom he has nothing to expect, and where he has no incitement but the intimate conviction that a higher and a nobler nature claims the sacrifice of the mere animal. He knows that he is rushing upon death, he feels, probably, some natural shudder in doing so; yet this is overruled, and he goes on with his resolute purpose. Take away the influence of such

a principle within, and half the actions of men are utterly unaccountable; for it is the natural tendency of all things to accomplish the end of their being; and if it be sentient, to be happy in doing so. The plant blossoms and bears fruit before it decays, and its life may be prolonged by preventing it from blossoming. The mere animal eats, drinks, propagates its species, and is satisfied; but man is always aiming at objects to which his life is frequently sacrificed, and no one calls him insane. On the contrary, in the proportion that he is ready with this sacrifice, he is honored and esteemed; because every one has an interior consciousness that it is what his own nature aspires to. He feels that he is now but the larva of himself, and that he has a higher career opening before him, where all that was beginning to develop itself will acquire perfection, where all the gentler sympathies of our nature may still find place and scope, and from whence the grosser animal gratifications alone will be banished, along with the earthly frame which required them.

## PRACTICAL RESULTS.

“WHAT is a Religion?” and “what is a system of Philosophy?” They are two different answers to the questions most interesting to man. Examine all the religions which have long held sway over the minds of men, all the philosophical systems which have united under their banner a large portion of the enlightened part of mankind, and you will find that these religions and their systems have one distinction common to both; that they have boldly proposed and solved the whole of those problems. It is by this character that we recognize a really great system, and we may truly say that if one of these questions has been pretermitted, it is but half a religion or half a system of philosophy. Would you have an example of the stretch and extent of a great religion, look at Christianity! Ask a Christian “whence the human race is derived?” He can tell you.—“What is man’s object, and what his destiny?” He can tell you. Ask a poor child from school, “why he is here, and what will become of him after death?” He will make you an answer full of sublime truths, which probably he may not half understand, but which are not, therefore, the less admirable. Ask him, “How the world was created, and why?” “How the earth has been peopled? why men suffer, and how all this will end?” He can tell. He knows the duties of man towards God and towards his fellow-men, and when he is older, and has learned the system more completely, he will not hesitate at all more respecting

natural, political, and national rights; for each of these parts of knowledge flows as naturally from Christianity as light from the sun. Such is what I call a great system.

These are the words of a French philosopher who himself was not a Christian,\* but I can find no words which would more aptly trace the way in which a "great system" must influence all the relations of life; and most truly does he pronounce that to be but a half doctrine which is incapable of this extended rule over men's minds and actions. When, therefore, I come to the practical result of a scheme of philosophy which walks hand in hand with the "great system" which M. Jouffroy has so well described, it will not be astonishing if I find myself obliged to touch on many points where great differences of opinion have existed. To those who may not take the same view of the subject, I can only say with Themistocles, "Strike, if you please, but hear me." Weigh at least, whether there be not some truth that deserves your farther attention in the propositions which at first may seem strange, and perhaps displeasing.

We have already considered the exterior and interior power in their separate nature and functions: we now come to the mutual relations which must subsist between them, and the influence these have on man's position, prospects, and finally destiny. We have seen man endued with instincts and facul-

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\* Perhaps I ought rather to say, that disgusted with the narrow views of contending sects, he was unable to find any one to which he could associate himself, and thus, unphilosophic only in this, overlooked his own proposition, that great systems, whether of philosophy or religion, are only two modes of solving the same question, not two solutions; and that, therefore, he who professes a pure and true philosophy is a Christian, whether he knows it or not.

ties purely corporeal in their origin and mode of exercise; and yet, in the midst of these corporeal instincts and faculties, we find another power introduced of a different nature, capable of diverting them from their natural course, and exercising an almost illimitable sway over them; like the musical instruments which by their regular machinery can produce a set number of tunes, but yet have keys annexed, by which a skillful player can produce harmony at his will: and this complex nature of man is the work of a Being who, having all power and all knowledge, must do what is best for the proposed end.

If we look through creation in every instance where we have an opportunity of watching the operations of *nature*, as writers on such subjects are wont to say, or as I should say, of the *Framer* of nature, we find no substance formed with particular properties for an especial occasion, which properties never come into use afterwards. Every chemist knows that each substance has its peculiar qualities and laws which avail equally be it free or in combination, be it part of an organized or an unorganized body; and that amid all the mutations which are continually going on, nothing is wasted, nothing so far changed in nature that it cannot be resolved again into its component parts, which by the same unchanging laws form fresh combinations, each nevertheless still retaining the fundamental character impressed upon it. We see too that all organized things,—I am not speaking now of man,—have exactly those qualities, organs, and impulses given them, which conduce to the end of their being; which end they scarcely ever fail to accomplish: the plant, the insect, the animal have their different modes of life and production; but they live and produce; no property inherent in them interferes to prevent this. We further see that when we have established

any great law of creation by reasonable induction, we can explain hitherto puzzling phenomena by a reference to these laws.

Upon these last grounds, then, I assume that man's instincts and faculties are given him for purposes of permanent utility extending beyond this life : because it is evident that he has a property inherent in him, which interferes with, and very frequently wholly prevents, the full development of his animal nature ; and therefore that animal nature, and the period of its duration, is not all of man. And if any one objects that man is in a fallen state, and therefore that these instincts and faculties are corrupt, and that we are not to look for good but for evil from them, I reply, that those who make this objection doubtless will allow that when man came from the hands of his Maker, his nature, as well as all the rest of the new world, was "very good." Now we have already seen that these instincts and faculties are corporeal ; provided for by a very simple and complete mechanism, but still by mechanism, as much as the bending of the joints or the growth of the body ; then these instincts and faculties were in man originally such as they now are, excepting in instances where they are impaired by disease, and are no more corrupt than his bones or his muscles ; and it is only when the individual power interferes to give intensity and duration to these animal functions, that they run into excess, and thus become an evil, from the due balance between them being overthrown. It is no small happiness to the world that those kindly feelings which bind man to man, are all found among the instinctive emotions, which being consequent on the very frame of man, and altogether involuntary in the first instance, are therefore in no danger of being ever wholly stifled ; while the sterner part of his nature

which we have called *the faculties*, result from cerebral combinations produced by a voluntary act, and therefore subsequent to the first impulse of sensation.

Let us now see how the individual is likely to be affected by this corporeal mechanism. He enters the world inexperienced and full of wonder at the scenes around him, and the first sensation that is awakened after that of mere appetite, is, love to the parent who cherishes him; the next, grief at the sight of an angry or a sad countenance. It is only gradually that the brain acquires power for its higher exercises, and long ere this has taken place, the feelings have taught the individual better than the most luminous argument could have done, that it is good to love those who are kind to us, and to avoid exciting their anger or their grief; and this is become so habitual, that a deviation from the usual course of feeling is painful in the first instance. Here then, the very first of instinctive emotions, provide a never-failing source of happy intercourse; and there is so much pleasure in yielding to them, that nothing further is requisite than a curbing power. The individual readily abandons himself to the gentle influence; but he may follow it too far. A parent or a companion may ask a wrong compliance: it is then that the intelligent will may call in the aid of the faculties to combine arguments, and weigh consequences; and, sitting like a sovereign at his council board, finally resolve, that the petitioning feeling ought not to be attended to. How soon the brain shall be capable of thus giving counsel, depends on the wholesome exercise it has had; for where no stores of knowledge have been laid up, arguments cannot be found; and where the habit has not been acquired by daily use, combinations of ideas are formed with difficulty. It would seem that mere

sensation had found itself the straightest road, and that the more complex convolutions in which, according to some, memory and the higher reasoning faculties are exercised, were so unaccustomed to be called into use, that the parts were grown stiff and inactive; nay, as we see that size and strength of limb is only gained by exercise, it is not impossible that a brain never called into use, may not even have its full proportions; and thus, from neglect in childhood, a physical incapacity may be engendered. Suppose this the case, and that either from want of exercise or of power, the faculties in their higher uses are not duly developed, it follows that the individual will, having no guide but the emotions, will follow them blindly, they themselves being but a blind impulse; and when "the blind lead the blind, both fall into the ditch." But this is no corruption of nature; all these functions are useful and good in themselves, it is merely a neglect of one part which throws the rest off their balance.

Let us now suppose that the faculties having been cultivated to the utmost, the will has listened to them almost exclusively: a harsh character will be engendered; for no human being is perfect, and if we bestow our regard *only* in the ratio of specific merit, we shall seldom find enough excellence meet our notice to justify any large share of it. It is then that a yet more powerful instinct steps in: love between the sexes teaches at once the generous self-devotion which the combinations of rational argument might have been long in inculcating, and perhaps have attempted ineffectually; and all the gentler social relations arise out of it to sweeten life, and give a yet higher scope to our wishes; for who that truly loves will be satisfied that the union shall be broken at the gates of the grave, which has been so sweet



an one through life? And how often do we see that he who cared not if his loose companions looked upon his vices, has shrunk from, and perhaps quitted them, when he thought of the innocent child whom he could not bear to contaminate! And thus we see two kinds of animal functions mutually balancing each other, uniting to school the individual will to all that is amiable and exalted. The instinctive emotions softening the sternness of the faculties, the faculties curbing the animal force of the emotions, and the will, impelled by the solicitations of the one, and guided by the information and caution of the other, acquiring by degrees those habits of judging and feeling rightly, which qualify man for the spiritual felicity of his Creator. He has learned the enjoyment of benevolence and the excellence of knowledge, and his heaven is already begun on this side the tomb; and thus, though these emotions and these faculties may cease with the bodily mechanism which causes them, they have stamped their impress on the individual. Like metal poured from the furnace into a mould, which retains for ever the form so acquired, though the mould be but of earth; the will has acquired the character it will carry with it into eternity, though the mould in which it was cast be returned to its dust.

Can the Christian who holds philosophy to be "foolishness," deny that these warm though instinctive emotions, these aspiring faculties, are in exact conformity with the rule he acknowledges? The God who made man was not so limited in power or knowledge, or so wanting in benevolence, as to have given him properties unfitted for the fulfilment of his high destiny. The Saviour himself has pronounced that a man shall leave all else to "cleave to his wife." He has given as the badge of his

followers, that they should "love one another;"—as the rule of our life, that we should strive to be "perfect, as our Father in heaven is perfect." We look into our hearts, and we find that we are naturally led to love the woman of our choice, beyond all other things; that we cannot be happy, or even retain a sane mind and healthy body without social intercourse, and that we aspire to knowledge, to greatness, to immortality, to perfection in short, with a longing that is never satisfied in this life, yet never wholly subdued. Is that philosophy *foolishness*, which by rational argument deduces the truths of the Gospel from the very nature of things, and thus leaves no room for hesitation or disbelief?

But if this be the case—if a due balance of instincts and faculties be needful to school the Will, so as to fit it for the only felicity suited to its nature—what sort of training ought man to have, and what must be the sensations of one who feels this truth deeply, when he looks round on the habits and maxims of society, and the principles on which legislation is too generally founded? "The poor man must learn to restrain his passions," say political economists;—let them first define what passion means. It is convenient when an ambiguous term hides instead of explaining the intention; and this well-sounding term means, that, because it suits those who have the power, to retain the soil as their own property, therefore the man who is debarred from any share of it, is to be debarred also from the due perfection of his nature. Those very instincts given to mould it to benevolence and kindness are to be rooted out; or, if God be stronger than man, and this endeavor fail, they are to be made instruments of evil instead of good, and what would have been the parent of all the lovely social affections, is

to become the mere appetite of the brute, indulged when the animal nature is importunate, but so indulged as to degrade and deteriorate, instead of improving the individual.

“We must have servants and laborers, hewers of wood and drawers of water,” say the rich and the luxurious; “it is therefore idle to teach the poor what will only set them above their work.” I only ask, does it so really? Where are the instances of the real lover of intellectual improvement, who has been inefficient in what he has undertaken? But suppose it were as is objected,—suppose a few hours were lost, or a few shillings spent on intellectual pleasures—do we never see either one or the other wasted at the beer house? And which is the better way of spending them? But setting aside all this, setting aside,—what I have always found,—that mental cultivation strengthens our power for whatever we undertake; I ask again, what right have you to cramp and stifle the intellectual faculties of a large portion of your fellow creatures, in order that you may purchase their bodily labor, even supposing that you could no otherwise secure it?—to rob men of the best gift God has given them, in order that you may “fare sumptuously every day, and “be clothed in purple and fine linen.” The mutes of the seraglio were deprived of the power of speech, that they might not tell the secrets of their master. Would you condemn as cruelty the depriving a child of one bodily organ, and yet justify the cramping the whole system of mental powers, merely that there may be a Pariah caste—a Helot race,—who shall never rise above the soil they tread on, and look up to their masters as to beings of another species? If such were to be the enduring state of society,

there would be some justification for those who might strive to overturn all existing institutions, in the hope that human nature would find means to assert its rights in the confusion. Such are not the lessons of the Gospel, for "there is no respect of person" before God, and yet probably never till now, and in this so called free land of England, was the distinction of rank made to press so heavily on the poor man. The slave in Greece and Rome was in some things better off. He was instructed that he might be serviceable; and finished, not unfrequently, by being the friend and companion of his master as his freed man. The mistress and her female slave sate and span together. In the modern states of continental Europe even, the servant or the laborer enjoys a certain degree of familiarity; and is in consequence more contented, though poorer. The increase of riches and refinement in England has given the upper classes a character of their own;—with a selfish exclusiveness, they wish to retain this distinction; and with an instinctive feeling that intellectual strength is power, however the maxim may have been hackneyed and ridiculed, they hide from their own hearts even, the uneasy dread of being encroached on, under the specious argument that for the poor man his Bible suffices. A blessed and cheering book it is doubtless; but how much richer a harvest of useful precept does it afford to those whose minds have been enlarged by further culture; how many mistakes would be avoided if the great principles of Philosophy were better studied; how much light would be thrown on it if something were known of the times, the places where, and the people to whom its words were spoken. The Bible alone is not enough; the mind requires relaxation: the commonest events of Eng-

land raise curiosity respecting other lands and habits of life; and the young who hear a sailor narrating the wonders of his voyages, or the soldier of his campaigns, naturally wish to know something about the things they hear of. Why is innocent pleasure to be denied them? We should have a more moral population if amusements of a higher and more intellectual character were placed within their reach. It is not enough to give them food and raiment merely, they feel the wish to be respected as men.

Let me not be misunderstood. I call for no agrarian law, no equality, which if established to-day, must cease to-morrow, from the very difference of individual strength and inclination; but I call for justice;—I call upon legislators to remember what God remembers, *i. e.*, “whereof we are made.” I call upon them not to damn their immortal fellow-men, by curbing with all the force of stringent laws on the one hand, and cold neglect on the other, the development of a nature which God looked upon when he had made it, and lo, “it was very good.” Interested men have parted what ought to have been joined. Philosophy and Christianity have been severed, and both have been made to speak a language foreign to their purpose; but though man for a time may obscure those eternal verities, it is but like the smoke which hides the sun; the light must break forth again; and let us thank God that it must.

It may be asked what I would substitute for the order of things I complain of? This is the ready way of getting rid of disagreeable representations, yet I will not shrink from this either; but the subject is large enough to require to be treated separately, and my business here is with the establishment of great principles; these once established,

details spring naturally from them. I return therefore for the present to man and his nature, position, prospects, and final destiny.

I have assumed, upon what I think sufficient ground, that all the phenomena of our nature are to be referred to animal appetite, instinctive emotions, faculties, and intelligent will, coupled with that memory which constitutes the perception of identity; and I have assumed farther, that the last class of phenomena only, can be considered as properly belonging to the operations of the soul. I have also stated that an essential part of the great Self-Existent Cause of all things is a free and governing Will. Man therefore in this bears the image of his Maker; and inasmuch as he partakes in a certain degree of the nature of his Creator, his happiness and his destiny must be of a kind somewhat analogous.

The felicity of the Creator, as far as we can judge, must consist in the constant harmony of his nature with his acts: in the will to do what is best, and the power to effect it; or, in other words, in unbounded knowledge, power, and benevolence. Now, though man's finite nature can follow but at humble distance, it *can* follow. He may act in conformity to his nature; he may delight in conferring happiness, and in seeking knowledge: and I believe all who have tried the experiment will bear testimony that this course confers, even in this life, a peace of mind, a joy even in the midst of the turmoils of the world, which is more akin to heaven than earth.

Christianity teaches this, but in a simpler manner, by precept without argument; and it might therefore seem at first sight that the argument was superfluous: but it is not; for those who attend only to the precept are apt to consider the command to "love our neighbor,"—to "be conformed to Christ,"

—to “be perfect as our Father which is in heaven is perfect,”—and the announcement of the misery that would attend the neglect of these commands,—as *merely arbitrary* laws, established by the Creator for reasons known only to himself; and He is thus made to appear as a despotic sovereign, to be feared because he has power to punish the infraction of his laws, rather than as an object of grateful and affectionate adoration, no less for the good he has given, than for what he has promised. Take the argument with the precept—show that it is in the nature of things that whatever felicity an intellectual being is capable of, must be akin to that enjoyed by the Deity; and that therefore if we seek happiness in any other direction, we shall necessarily fail of our object—and we immediately see the fatherly kindness of the command; and the very announcement that any other course would be attended with perdurable misery, instead of appearing in the light of a vindictive denunciation of punishment shows itself to be what it really is—the caution of an affectionate and anxious parent, who

“ metuensque moneret  
Acres esse viros, cum dura prælia gente;”

and does not send forth his child to the combat till he has given him every counsel, and provided him with every defence which the fondest concern could dictate.

This is not, I am aware, the most usual mode of viewing the subject, and it is perhaps because it is not, that our religion is frequently cold and unprofitable. If the conforming our will to the will of the Deity, or, in other words, the finding our pleasure in the same objects, be requisite to our happiness, it is clear that *fear* will be a very ineffectual agent

in the business. We may choose a certain course of action because we dread the punishment consequent on the contrary course, but we shall not do so because it is a *pleasure* to us. Even the most unphilosophical religious teacher will allow that this is not the state of mind which the true Christian should aim at, for, says St. John, "Perfect love casteth out fear;" and nothing can be juster than the distinction made by the late Alexander Knox, between the imperfect Christian who *fears*, and the perfect one who *loves*; for as the doing an act under the dread of punishment is but a yielding of the will to one of the least exalted of the animal emotions, so it tends very little, if at all, to the amelioration of the character. The evil actions which might engender evil habits have been avoided, but we have accustomed ourselves to be actuated by a cowardly motive which a great mind ought to despise, and a Christian to eschew. Added to all this, the emotion which is the foundation of this kind of virtue is of a painful nature, and therefore another instinctive emotion,—that of shrinking from present suffering,—very quickly counteracts it; for in proportion as the fear is great, will be the effort of nature to allay or stifle it; thus the small influence it exercises over the will is transitory also.

It is no new discovery of mine that we must do what we like, or, in other words, like what we do, in order to be happy. All men know and act upon this principle; can we suppose it unknown to Him who made us? and can we suppose also, that knowing the conformity of our will to His to be our happiness, He would take by preference so inadequate an agent as fear, to lead us to identify ourselves with Him? for this identity of will with the Deity, it cannot be too often repeated, is the sum and sub-



stance of religion as well as of philosophy. We are to become, as it were, a part of the Divine essence; his *children*; one in our interests, our affections, our designs: and thus identified with the Father of our love, we have his wisdom for our guide, his power to effect our utmost desires. A religion made up of terrors offers no attraction; we only half believe it, for it is repugnant to all our rational and instinctive feelings; it is unlovely; we cannot cherish it in our hearts as the source of happiness, or keep it beside us in our lighter hours as our companion and guide. On the contrary, the philosophic view being in itself pleasant, never seems importunate or misplaced: it lays hold on our feelings, and dwells with them till it becomes a constant principle of action. It is rational and satisfies the intellect; and the will thus learning to love what is both agreeable and wise, all inclination to any other course disappears. We feel that by pursuing a different one we should be unhappy; for it is not till we have depraved our nature that we make even a step in the wrong path without pain, and what at first was weighed and judged fitting, becomes at last so habitual, that we may act almost without reflection, and act right.

There is always one great obstacle to the reception of the simple religion or philosophy (for I know no difference between them) taught by Christ during his ministry on earth; it is its *very simplicity*. It is hard to persuade men that it is not some "great thing" that is required of them; like Naaman, who despised the order to "wash and be clean" of his leprosy. Yet it is this simplicity, this conformity to common sense and common feeling, which proves its divinity the most decidedly; for the law, and the nature to be governed by that law, have evidently

been the work of the same hand. "Est enim virtus nihil aliud quam in se perfecta et ad summum perducta natura,"\* said the Roman philosopher long ago, and it is a truth well worth remembering. The same objection that is now made to the rational views of Christianity, viz., that it makes its professors men of this world, was made to its first great teacher; "Behold a glutton and a wine-bibber, a friend of publicans and sinners." Yet when the Saviour thought it not beneath him to sit at the table of Zaccheus at what we should now call a large dinner party, it is evident that no sour restraints are imposed on the Christian, even if we have never heard of any rule of life but the following His steps who was sent to be an example for us. The Saviour did not sit at that table in vain; we hear of no severe reproofs; no stern lecture; but he who knew well what man's affections could do, won the heart of Zaccheus. "The half of my goods I give to the poor, and if I have done any wrong to any man, I restore him fourfold," was the resolution taken by the giver of the feast at that dinner; and it is thus that the servant of Christ, the philosopher in the true sense of the word—for what is love of wisdom but love of the wisdom or *λογος* of God?—it is thus, I say, that the servant of Christ may move in the world, blessing and blessed. Polished, eloquent, dignified, Christ exhibited, amid the world which he did not fly from, a pattern of everything that was attractive in man. So may, and so should the Christian; and thus sanctify and purify society by his presence and example, till the precepts of our great Master become its precepts also; till forgiveness of injuries and purity of life be thought as

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\* "Virtue is nothing but the utmost perfection of our nature."

*virtue is nothing but the utmost perfection of our nature.*

necessary to the character of a gentleman, as truth is even now; till amusements and business, trade and politics, shall alike own the healing influence, and "the kingdoms of the world" become what,— notwithstanding the boastful title of Christendom,\*— they never have been yet, "the kingdoms of God and of his Christ."

It was the pure philosophy of Christianity, its exact accordance with every want and wish of our nature, that spread the doctrine of the poor fishermen of Galilee through the palaces and the schools, no less than the shops and the farms, of Greece and Rome. It has now ceased to spread, and why? Is it not because its Philosophy is forgotten? Is it not that by being made to consist in a certain set of mysterious dogmata which it is almost forbidden to examine, it is put on a level with those false systems which shrink from the light, because they know they will suffer from being seen when exposed to it? It was not thus that Christianity was *first* preached to the world. Its teachers and its martyrs appealed to its rationality, to its accordance with the highest conceptions of the wisest and the best of the Grecian sages. They contrasted its purity with the abominations of Paganism; the brotherly love of its followers, with the ferocity, treachery and hatred of the rest of the world; they showed that there must be a God, and that He could be no other than they described. The Eternal God, said they, must be essentially rational. Exerted or not, the wisdom to know, and the power to act must be co-eternal in him. We do not worship two Gods, as you object to us; the λογος (rational faculty) of God, animated a human form, and spoke to us through human lips, "God was in Christ reconciling

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\* The domain of Christ.

the world to himself," and him we worship. We do not say that our God suffered or died. The body which he wore as a raiment was sacrificed, but God is impassible, ONE SELF-EXISTENT ETERNAL MIND.\* It was thus that the early apologists for Christianity explained its tenets to the Pagan world; and the Pagan world received them. What have we gained by abandoning the philosophy of these Martyrs of the truth? We have abundance of technical terms; but have we the *Spirit* of the Gospel? Do we bear the badge of Christ, "hereby shall men know that ye are my disciples, that ye love one another?" If we do not—if rich and poor, Dissenter and Churchman, Romanist and Socinian, are, as it were, separate classes that hold no fellowship together—then is our Christianity as faulty as our philosophy—we have "the *form* of Godliness," but not "the *power* thereof," and however we may boast "the temple of the Lord" (and, blessed be God, it does yet afford shelter to some whom their Lord at his coming will own as his true disciples), we may find at last that phrases are of less importance than motives; and see,—Heaven grant that it may not be too late!—that "God is no respecter of persons," but that "in every nation he that feareth him and worketh righteousness is accepted with him."

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\*Vide Tertullian, Athenagoras, Arnobius, &c. &c.

FINIS.



THE CONNECTION

BETWEEN

PHYSIOLOGY

AND

INTELLECTUAL PHILOSOPHY.

*by J. Barlow*

SECOND EDITION ENLARGED.



PHILADELPHIA:  
LEA AND BLANCHARD.  
1846.

*Handwritten signature or scribble*

**PHILADELPHIA :**  
**T. K. AND P. G. COLLINS,**  
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## ADVERTISEMENT TO THE FIRST EDITION.

IN complying with the wish of those friends who requested me to offer this Lecture to the Public, I am extremely anxious to serve what I believe and hope to be an increasing class of my countrymen. It is my strong desire to benefit those who, though eager for information, cannot afford much time or much money for the prosecution of philosophical inquiries. It is then to the intelligent artizan, who prefers the Mechanics' Institution to the poisonous atmosphere and contaminating society of the gin-shop: it is to the agriculturist and the tradesman who have discovered that an evening spent in the smoking-club is not productive of enjoyment equal to that derived from the perusal of such books as awaken a spirit of research in their children, that I dedicate this volume.

In revising it, I have been aided by the works of many eminent physiologists, and by the advice of many kind cotemporaries. Among the latter, I may reckon the Author of "*Philosophical Theories and Philosophical Experience*," to whose work, through the medium of a friend, I had access while



it was yet in manuscript, and whose object it has been, in common with some other of his intimates, to bring philosophy into a form that might benefit the mass of mankind, instead of being the mere luxury of a few learned men.

But to name the authors I have consulted, and the persons to whom I owe obligations, would be mere ostentation. It is enough to say that I have not knowingly neglected any source of accessible information. While I have striven to make these pages familiar and intelligible to all, I have never been led to adduce a doubtful in preference to a sounder theory, by the greater ease with which the more questionable doctrine might be expressed. At the same time I have avoided entering on any controverted subject; and therefore I have neither engaged with the interesting speculations of the phrenologists, nor with the excito-motory system of Dr. Marshall Hall, powerfully and attractively as it has been advocated by that philosopher, by Mr. Grainger, and other eminent physiologists.

J. BARLOW.

London, January, 1842.

## ADVERTISEMENT TO THE SECOND EDITION.

**THE** little work of which a second edition is now presented to the public, originally formed one of the Friday Evening communications to the members of the Royal Institution of Great Britain. The short space of time allotted to these communications,—one hour,—necessarily limited the speaker in the treatment of his subject to the narrowest possible bounds, and the Editors conceive that the favor with which it has already been received will not be lessened by some addition to its contents, which will enable them to give a somewhat more expanded view of this most interesting part of physiology, as well as to notice any farther discoveries which may tend to throw light upon it.

The Editors of the “Small Books” have already had occasion to notice the almost unexpected success which has attended their undertaking: of course this excites a corresponding zeal to deserve it, and they flatter themselves that the increased quantity of letter-press in the later numbers of series will be such as to meet the wishes of those who before considered the price too high for the size of the books.



# CONNECTION BETWEEN PHYSIOLOGY

AND

## INTELLECTUAL PHILOSOPHY.



### I.

1. **THERE** is probably no man, who ever thinks at all, who does not sometimes ask himself how that thought is accomplished; how he is so linked to, yet separate from, the exterior world; and how and why he is different from the tribes of sentient beings which surround him. He has seen the progress of human nature almost unlimited; yet a disease, the work of a moment, leaves this half godlike creature a helpless and unreasoning animal. He shrinks with a kind of instinctive horror from a state which would yet be the natural and happy one of many of those classes of sentient beings, and anxiously asks himself, "What then is his destination? What the ultimate object of his existence?" These are a few of those riddles of life, which, however little they may form the topics of general conversation, lie uneasily in the secret recesses of most men's minds; and if in our subject of this evening I can solve some of them, my hearers will probably not think their attention ill bestowed.

2. The earth, the water, and the air, are thickly peopled with various forms of living creatures: it is therefore desirable no less for the common intercourse of life than for scientific purposes, that these animated beings should be grouped together on some principle of mutual resemblance; accordingly, systems of classification have been in use from the very earliest periods. I do not now purpose to enter into the history or the comparative merits of these modes of classification; it is sufficient to select the one which I believe to be most philosophical, which I know to be best adapted to make my views intelligible, and which originates from the most eminent physiologists of our time. It is based on the difference of the *nervous system* in the respective classes, which is more and more developed in each, till it arrives at its final perfection in man.

a. *Crypto-neura*, the hidden-nerved.—*Rudolphi*.\*

This includes coral insects, madrepores, sea-anemones, sea-nettles, hydatids, flukes, some abdominal worms, &c.

In these animals,† “The neurine or nervous matter, if existing at all, being incorporated with the other tissues, cannot be demonstrated as forming a separate system.”

b. *Nemato-neura*, the thread-nerved.—*Owen*.

This includes many of the infusorial and microscopic animalcules, and (what the ordinary observer is more familiar with) star-fishes, sea-urchins, &c.

In these animals there is usually found a thread-like ring round the gullet, from whence

\* *Beyträge sur Anthropologie*, quoted by Jones, *General Outline of Animal Kingdom*, p. 6.

† Solly on the Human Brain, p. 5.

minute filaments occasionally proceed to other parts of the body.

- c. *Homogangliata*, animals whose ganglia are symmetrically arranged.—*Owen*.

This division comprehends (together with less known animals) leeches, earth-worms, scolopendras, insects, scorpions, spiders, lobsters, crabs, &c. This division is characterized by having the nervous masses (*ganglia*) distributed over the body at regular intervals, corresponding to its well-defined segments.

- d. *Heterogangliata*, animals in which the arrangement of the ganglia is not symmetrical.—*Owen*.

In this division are found barnacles, oysters, muscles, snails, cuttle-fish, &c.

In this large group of animals, that symmetrical arrangement of parts so conspicuous in the ray of the star-fish, the segment of the insect, &c., is no longer observable; and the nervous system is as irregular in its distribution as the organs which it supplies are disproportionate to each other in their size.

- e. *Myelencephalia*, animals possessing a brain in a bony skull.—*Owen*.

This group requires no additional description at present; it comprehends fishes, frogs, reptiles, birds, mammalia, and at the head of these, Man.

3. It will be observed in the foregoing table that a nervous system has been traced in all animals (that is, in all beings that can feel and move), except in those comprehended in the division *a*. But it is extremely probable that this system also exists in the *cryptoneura*, although its presence has not yet been detected in them,\* since they exhibit sensation

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\* Carpenter's Inaugural Dissertation, p. 76.

and voluntary powers. The nervous system consists,

1. Of nerves and irregularly shaped masses of nervous matter, called ganglia.
2. Of a prolonged cord of nervous matter both vesicular and fibrous, sheathed in its proper membranes;—or as some think, of a series of connected ganglia;—the whole protected by the vertebræ of the spine, which are hollowed to receive it.
3. Of a superadded brain, or, as some have considered it, a collection of ganglia connected with the organs of sense. This brain is always defended by a bony case, or skull. It is found only in the animals of division e.
4. The nervous matter which forms this complicated system is varied both in appearance, and most probably in function. It may be classed under two divisions, the vesicular and the fibrous. “The *vesicular* nervous matter is gray or cineritious in color, and granular in texture: it contains nucleated nerve vesicles,\* and is largely supplied with blood. It is more immediately associated with the mind, and is the seat in which originates the force manifested in the nervous system. The *fibrous* nervous matter, on

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\* “The essential elements of the gray nervous matter are *vesicles*, or cells containing nuclei and nucleoli. They have been called nerve or ganglion globules. The wall of each vesicle consists of an exceedingly delicate membrane, containing a soft but tenacious, finely granular mass. The *nucleus* of the cell is generally eccentric, much smaller than the containing vesicle, and adherent to some part of its interior. Its structure is apparently the same as that of the outer vesicle. The nucleolus is a minute, remarkably clear, and brilliant body, also vesicular, enclosed within the nucleus. It forms a most characteristic and often conspicuous part of the nerve-vesicle.” Todd and Bowman’s Physiology, vol. i. p. 212.

the other hand, is, in most situations, white, and composed of tubular fibres, though in some parts it is gray, and consists of solid fibres. It is less vascular than the other, and is simply the propagator of impressions made upon it. When these two kinds of nervous matter are united together in a mass of variable shape or size, the body so formed is called a *nervous centre*, and the threads of fibrous matter which pass to or from it are called *nerves*. The latter are *internuncial* in their office: they establish a communication between the nervous centres and the various parts of the body, and *vice versâ*. The smaller nervous centres are called *ganglions*: the larger ones, the *brain* and *spinal cord*.”\*

5. When examined by the naked eye and the finger, a nerve is a soft, white, thread-like substance. In its course it resembles a leafless branch. It spreads out into small nervelets or filaments, and thus diminishes or increases in size according as it is traced *from* or *towards* the central cord or ring in which it originates. But when carefully viewed by the microscope,† each nerve is found to be a mere bundle of extremely small tubular filaments, containing a sort of half fluid pith. These are separately enclosed and connected together by a covering of a very delicate texture, and the whole is cased in a thin membranous sheath. These fibrils sometimes unite with, sometimes cross over each other, sometimes form new groups with detachments from other bundles, sometimes are twisted over each other: but in no instance does the minutest fibril so penetrate another that there can be a mixture of their component particles. Therefore, although the number of

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\* Todd and Bowman's Physiology, vol. i. p. 205.

† Carpenter's Principles of Physiology, p. 42.



nervous filaments is immense, there can be no confusion in the discharge of their functions. "The nerves appear to be formed after the same manner as the muscles, i. e., by the fusion of a number of primary cells arranged in rows into a secondary cell. The primary nervous cell, however, has not yet been seen with perfect precision by reason of the difficulty of distinguishing nervous cells, while yet in their primary state, from the indifferent cells, out of which entire organs are evolved. When first a nerve can be distinguished as such, it presents itself as a pale cord with a longitudinal fibrillation, and in this cord a multitude of nuclei are apparent." "According to Valentin's description, the following is the process of development of the nerve vesicles. In the very young embryos of mammalia, as the sheep or calf, the cerebral mass in the course of formation contains in the midst of a transparent blastema, transparent cells of great delicacy with a reddish-yellow nucleus. Around these primitive cells, which we find likewise formed after the same type in the spinal cord, a finely granular mass becomes deposited, which probably is at first surrounded by an enveloping cell membrane. At this early period of formation the primitive cell still preserves its first delicacy to such a degree that the action of water causes it to burst immediately."\*

6. The functions of the nerves are various: experience has shown that the intervention of nerves is absolutely necessary; 1, to the continuance of animal life; 2, to the reception of sensation; and 3, to the production of movements in all the higher orders of animals; and from analogy it has been conceived that even if it have hitherto eluded observation,

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\* Todd and Bowman's Phys., vol. i. pp. 227, 228.

nervous matter does exist, even in the lower tribes; for organic life is possessed no less by the rooted zoophyte, which seems scarcely to have any consciousness of the exterior world, than by man. But the actions of man being all destined to be modified by his rational faculties, a more complex arrangement is requisite in his case, in order to bring the whole system into harmony. The functions of animal life, therefore, are carried on by a machinery which, though capable of acting alone, is yet so connected with the organs of the higher faculties, as to be placed in great measure under subjection to them.

7. At the head of this machinery stands that set of ganglia, and their connecting nerves, which is known to anatomists as the *sympathetic, ganglionic, or tri-splanchnic\** system, or sometimes, in older writers, as *the great intercostal nerve*. This is found extending from the base of the skull in a double chain of ganglia on each side of the vertebral column, interiorly as regards the body, and passing within the ribs towards the lower part of the trunk. Throughout its course, numerous nerve fibres are thrown out to supply the viscera both of the thorax and abdomen, and "branches attach themselves to the exterior of arteries, forming very intricate plexuses, which entwine around them, hederæ ad mo-

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\* So called from *σπλαγγνα*, viscera: "We may with de Blainville consider it as divisible into two parts, one placed in front of the spine (prævertebral) composed of plexus and ganglia (semilunar and cardiac), whose branches are distributed to the primary organs of digestion and circulation: the other consisting of two knotted cords, extended along the whole length of the spine, communicating with the prævertebral plexus on the one hand, and with the cerebro-spinal nerves on the other."—*Quain and Wilson's Anatomy of the Nerves*, p. 4.

dum" (Scarpa). The ganglionic system is closely connected with both the brain and spinal cord at its offset, and keeps up a communication with this last, through the whole of its course, by means of a white and a gray filament, which both pass between each ganglion and the anterior root of each spinal nerve. Thus the series of nerves and ganglia which send out branches to every part connected with respiration, nutrition, and circulation, are united by interchange of fibres with the spinal cord, and are thus connected with the brain.

8. The sympathetic system may be considered as the chief agent in the maintenance of animal life: for the maintenance of life depends on nutrition, and nutrition consists in the constant assimilation of fresh substance to supply the place of what is thrown off in the continual state of movement and change which constitutes what we term good health. The analysis of animal bodies gives about four elementary substances (hydrogen, oxygen, carbon, and nitrogen), which are found in like manner to compose the air that we breathe and the food that we eat: but no human art has succeeded in compounding from them the smallest particle of organized matter, and we remain in great measure ignorant of the exact nature of the changes which convert food and air into the texture of the body. All that we can know, therefore, is, that the *sympathetic system* is the immediate instrument of effecting these changes, and that by some yet undiscovered properties of its nerves and ganglia, inanimate matter is made to share the life of the part to which it is assimilated. It is remarkable that, unlike all other nerves, those connected with the system we are describing, are neither susceptible of sensation so long as they continue in a healthy state, nor do they require an effort

of the mind to keep them in action. The organs supplied by the sympathetic nerves are equally unlike the other members of the body in properties and in structure. For the limbs are disabled for a time by fatigue after long-continued exertion, whereas the heart, lungs, &c., whose vital action is sustained by this system, never require rest, although always in exercise. As it is essential to our existence that the operation of these organs should be unintermitting, it is most fortunate for us that they so rarely excite our notice; for we should never enjoy a moment's repose, were it necessary to keep up the circulation, respiration, &c., by a constant attention to them. And though this system exacts so little from our intellectual powers, rejects the control of our will, and rarely disturbs us by exciting a sensation, it nevertheless does strongly sympathize with our bodily and mental feelings. The heart, whose unwearied and unfeared movements are the result of its influence, throbs uneasily during the period of anxious and fearful expectation, and so forcible is the impulse given by powerful emotion, as sometimes to rupture the parts by a rush of blood. I have already touched on the connection of nerves by which this is effected, and it must be noticed again when I come to treat of instinctive emotions.

9. Such then is the apparatus of mere *organic* life. But this life requires support and defence in all but the very lowest division of the animal kingdom. The *crypto-neura* are, indeed, without exception, inhabitants of fluids; they therefore depend for subsistence on the casual nutriment that may be floated towards them: their bodies, too, like plants, may be mutilated to a great extent, and yet preserve their vitality, as they are capable of reproducing a

severed part: but it is not so with the higher orders of animals: with them dismemberment is fatal, or at best irreparable. These also have to select or to seek their food, and must be warned against the approach of danger: a further apparatus of nerves is accordingly provided, by which they can take cognizance of external objects, and these nerves are usually termed the *nerves of the senses*. I shall not stay to inquire in how large a degree the inferior orders of animals possess them; in the higher they consist of smell, sight, hearing, taste, touch, and perhaps,—for on this point physiologists are not wholly satisfied,—of general sensation.\* For all but the two last named,

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\* A curious case recorded by the late Dr. J. Cheyne seems to favor the opinion that there may be a set of fibres conveying to the brain a sense of general sensation independent of the sense of touch. "We know an instance," says he, "of a remarkable delusion, arising from complete loss of feeling in the left side of the body, caused by an attack of palsy, which first originated, and then fatally terminated in apoplexy. In the morning the individual maintained that he had two left arms, and when we tried to convince him that he was under a misconception, he promptly offered to produce the supplementary arm. 'There it is,' said he, patting his left shoulder with his right hand. 'Well then,' it was asked, 'where is the other?'—On which, turning round his head with great alacrity to show it, he seemed much disappointed when he could discover but one arm, vehemently declaring that 'there were two, in the night.'" *Cheyne's Essays*, p. 60. Here there must have been general sensation in the arm, or the patient would not have felt that he had an arm at all—but when in the night he felt but could not see that he had an arm, and on touching the surface of the palsied limb with the other hand, was sensible of no impression, he naturally supposed the real arm to be existing behind or beside the dead substance which he touched. Between sleeping and waking even in health we do not always reason, and here probably the reasoning power was somewhat disturbed by the lesion of the brain. If there should be a sense of this kind, it would account for the fact that *pain* is felt in palsied limbs which are insensible to touch; as well as for those cases of insanity or idiocy where the sense of touch remains, but that of heat, or the pain ensuing from a burn, is lost.

if two they be, a system of nerves within the skull, and in direct communication with the brain, is provided; whereas, the sense of touch being distributed over the whole body, is conveyed to the common centre of sensation by an immense number of nervous filaments, which either plunge into the spinal cord through small openings in the bone provided for them, and thus find their way to the brain, or are immediately connected with it.

10. Thus far I have described the machinery of life and sensation only, but it is further necessary that the living sentient animal should have the means of preserving his existence, of seeking pleasure, and of avoiding pain. This is accordingly provided for by another set of nerves, *the nerves of voluntary motion*. The operation of these nerves however is, in respect of direction, opposite to that of the nerves of sensation. It is by means of the latter that constant communications from all parts of the body to the brain are carried on. The nerves of motion on the contrary issue *from* the brain, and convey its mandates to whatever part it would control. This constant interchange somewhat resembles what is carried on between the provinces and the capital by the mail-trains. The nerve of sensation, like the train which conveys letters to the capital, receives continual contributions from the tracts which it passes through, until the whole, compressed into the smallest compass, is delivered at the central post-office: and in like manner the nerve of motion, like the out-train, keeps sending forth its district mails at each successive station, until the most distant one is delivered at the terminus.

11. Thus we have three distinct systems of nervous mechanism in the living body, each dependent on the other, namely,

- I. The unconscious involuntary nerves of life;
  - II. The conductors of external and internal feelings to the brain;
  - III. The conveyers of volition *from* the brain to the organs fitted for action;
- which are respectively termed the *sympathetic*, the *sensitive*, and the *motor* nerves.

12. I have already described the Sympathetic System (7) as a series of ganglia with connecting nerves, whose office it is to supply the nervous energy by which the functions of circulation, secretion, &c., are unconsciously carried on. The composition of these nerves differs considerably from that of the spino-cerebral system, being formed chiefly of a gray gelatinous fibre, not found in any great abundance elsewhere. These fibres seem to form an intermediate substance between the vesicular, and fibrous nervous matter; (4.) for they contain among them "numerous cell nuclei, some situated in the centre of the fibre, others adhering to either edge, and frequently exhibiting distinct nucleoli."—"The mode of connection of the gelatinous fibres with the elements of the nervous centres," say the authors of the work from which I have already quoted, "is, as yet, quite unknown. They are found in considerable numbers in what are called the roots of the Sympathetic, or the communications of that nerve with the spinal nerves; and it has been supposed by Valentin that they are continuous with certain elements of the vesicular nervous matter."\*—That vital power by which the common functions of nutrition and reproduction are carried on, has been termed by Professor Liebig,—“vegetative life,” and in the acknowledged obscurity which hangs over the *modus operandi* of

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\* Todd and Bowman's Phys., vol. i. p. 212.

the nervous power, it may be allowed to throw out as a hint for future consideration, that the cell nuclei so largely interspersed among the gray gelatinous fibres of the sympathetic ganglia and nerves, have no small analogy with the primitive forms of the vegetable world. In both kinds of organic life, the cell seems to be the first and simplest form assumed by incipient organization;\* in both the granules contained within the cells have been seen in motion,† although no shock has been communicated to them externally. Whence this motion arises is not easy to decide, but movement being produced, the first condition of assimilation, and consequently of the maintenance of life, is there. And here a wide field opens itself:—electricity has been considered, nay, may we not say, proved, by Prof. Faraday to be merely a phenomenon of matter, the consequence of molecular movement communicated by chemical change; and Prof. Matteucci of Pisa has proved by a series of experiments that animal muscle is capable of taking the place of metals in forming a galvanic

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\* See Carpenter's *Physiology*, p. 15.

† "Such motions are either of a uniform and rhythmical kind, or they are apparently irregular and oscillating. Those of the former kind are familiarly known in the vegetable kingdom by the *Cyclosis* which takes place in the oblong cells of *Chara*. The granules which may be seen in motion are quite passive, and are carried along by currents within the cell. Motions of the latter kind have been seen by Schwann among the granules contained in the cells of the germinal membrane of the hen's egg, as if occasioned by an endosmotic current through the wall of the cell. This membrane is the seat of active change, the development and growth of new cells destined for the evolution of the textures of the embryo. A molecular motion of the same kind may be seen in the very minute granules which occupy the cells of the membrane of black pigment on the choroid coat of the eye. Whether this goes on during life is of course impossible to say, but the conditions for its production are undoubtedly present." *Todd and Bowman's Phys.*, vol. i. p. 59.



current.\* and heat is generated where electrical action is excited. No series of experiments has yet *proved* that these isolated facts of science have any intimate relation to each other, but an inquiring mind cannot avoid asking the question, have they not?—Is not the movement which is excited within the primitive cell,—though perhaps merely the result of endosmose,—the first step in a series of phenomena, each resulting from the other till the most complex machinery of organic life is developed and kept in action.† Whether the nucleated cells found so plentifully scattered among the gray fibres of the sympathetic system may generate and propagate such movement, of course is not, perhaps never may be, ascertained; but if it were so, it would be one more instance to add to the many that modern science has

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\* “The organic actions of muscle by which the electrical current is developed may be compared to the inorganic phenomena attending its production from the decomposition of metals. When a plate of metal, immersed in an acidulated fluid, is oxidized by the oxygen of the water, and then dissolved in the acid, we admit that an enormous quantity of electricity is developed during this action.—The metal acted upon in the artificial arrangement is represented, in the phenomenon of the muscular current, by the muscular fibre; the acidulated fluid is the arterial blood. The surface of the muscle, or any other conducting body, not muscular fibre, but which is in contact with the muscle, represents the second plate of metal, which does not suffer chemical action, and which serves only to form the circuit. The direction of the muscular current is precisely such as it should be supposing the current to be as we have represented it, due to chemical action taking place in the interior of the muscle.” (The direction of the current is from the interior to the exterior.) The above is quoted from Matteucci’s communication to the writers of the work on Physiology already quoted, vol. i. p. 383, and there the experiments are detailed by which Prof. Matteucci proved the facts above stated.

† Both electricity and heat are present in the germination of seeds;—are not both, possibly, modifications of molecular movement?

discovered, of the beautiful simplicity of means by which the mightiest effects are produced, where **PERFECT KNOWLEDGE** and **PERFECT POWER** have been employed in conjunction.

13. We have now to consider another system of nerves differing both in function and appearance from the foregoing: i. e., the spinal. These issue from each side of the spinal cord, to the number of thirty-one pairs, but each individual nerve is attached to the cord by two sets of filaments (15) which from their respective situations are termed the anterior and posterior roots of the spinal nerves.\* The posterior root is distinguished by a ganglion found on it near its point of junction with the cord; the anterior passes over this ganglion, but sends no fibres into it, although both at their exit from the vertebral column are wrapped in the same common covering: but presently after, the fibres of each root cross over each other, and the two great branches into which this compound nerve soon divides, contain bundles of fibres connected with both roots. It had long been observed that, in cases of palsy, sometimes the power of voluntary movement, sometimes the sense of touch was destroyed, and this, upon examination after death, was found to have been caused by a lesion of some part of the brain; at other times the same effect was produced by injury or disease of different parts of the spinal cord. About the beginning of this century this circumstance began to give rise to speculations on the possibility that the separate roots of the nerves might have separate functions, and that the fibres of each root which, though crossing and intermingling in their common sheath, are yet kept perfectly separate by the fine membrane or

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\* See Quain and Wilson's *Anatomy of the Nerves*, p. 35.

nerve lemma that invests them,—might be the means of carrying to the brain the sensations received at the extremities, on the one hand, and conveying back its mandates on the other:—in short, that these roots were respectively sensitive and motor, consisting of fibres communicating with certain tracts of the spinal cord, which in their turn communicated with the brain, and thus that injury of any part of the sensitive tract would destroy sensation;—or in like manner impede the propagation of movement to the limbs, if the injury happened to occur in its path. Curiosity being thus awakened, numerous experiments were made, in order to ascertain the fact: and living animals were mutilated and tortured without mercy for the purpose of determining which function belonged to which root. It is extraordinary that even if humanity did not prevent this, common sense at least should not have interfered so far as to suggest that when the processes of the spine have been hacked open,—when pain and loss of blood have disordered all the functions of nature,—and when,—happily for the poor animal,—death is imminent,—no rational conclusion can be formed as to the normal functions of the parts.\* The controversy was long

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\* “Direct experiments on the anterior and posterior columns of the cord are surrounded with difficulties which embarrass the experimenter and weaken the force of his inferences. The depth at which the cord is situate, in most vertebrate animals, its extreme excitability, the intimate connection of its various columns with each other, so that one can scarcely be irritated without the participation of the others, the proximity of the roots of the nerves to each other . . . sufficiently explain the discrepancies which are apparent in the results of the various experiments which have been published.—‘If the anterior fasciculi of the cord,’ observes Dr. Nasse, ‘possess sensibility but only in a slight degree, the mere opening of the vertebral canal, and laying bare the cord, must cause such a degree of pain as would

and hot; and many opinions were broached as to the functions of the anterior and posterior roots of the spinal nerves which subsequent and calmer investigation has greatly modified. The common sense view too has gained ground, and it is acknowledged that a careful register of the phenomena of disease, followed by a post-mortem examination, is generally more to be depended on than the experiments, so revolting to humanity, which were at first resorted to; but from which, nevertheless, different theorists drew different results, each in favor of his own especial view of the case.

14. Whilst the controversy was yet raging with a fierceness hardly befitting a scientific question, Dr. Marshall Hall suddenly stepped in,\* and gave a new character to the inquiry. He proved that there were many actions which appear to be voluntary which nevertheless take place during a state of utter insensibility,† or even, in some animals, as in

weaken or destroy the manifestation,' &c.'" *Todd and Bowman's Phys.*, vol. i. p. 317.

Alas! that this should have been only a late thought! too late to prevent the infliction of tortures which the mind shrinks from contemplating, and which I will not pain my readers by detailing.

\* I give the name of this gentleman because he was the most active in drawing attention to phenomena, which, though they had been noticed by some others, had not been sufficiently considered.

† The *cerebral* system of nerves conveys impressions from every part of the body to the *brain*, and the individual then *feels* them as *sensations*, and by the fibres of the same system, which pass from the brain to the muscles, the *will* acts upon them in producing voluntary motion. Now the brain is not in constant action, even in a healthy person; it requires rest: and during profound sleep it is in a state of complete torpor. Yet we still see those movements continuing which are essential to the maintenance of life,—the breathing goes on uninterruptedly,—liquid poured into the mouth is swallowed,—and the position is

the turtle, for instance, after decapitation: actions which continued to be performed for some time whilst the spinal cord remained intact, but ceased instantly on its removal. It was farther shown, that in the case of a monstrous birth, where the brain was wholly wanting, the infant, during some hours sucked and performed the other functions of complete animal life; and that in palsy, limbs which were insensible to the commands of the will, had yet their own proper movement. Hence it was very rationally inferred, that the spinal apparatus is sufficiently independent of the brain, to be capable of action without its aid, and that by its intervention many of the actions requisite to the preservation of life can be, and actually, in many instances, are performed: thus proving that *besides the unconscious vegetative life of the sympathetic system, there is an unconscious animal life, whose centre is to be found in the spinal cord.* For these functions, which he distinguished as *reflex*, Dr. Marshall Hall supposed a peculiar set of fibres to be appropriated, which he termed *excito-motory*. He considered that "the various muscles and sentient surfaces of the body are connected with the brain by nerve fibres which pass from one to the other. Those

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changed when the body would be injured by remaining in it. The same is the case in apoplexy, in which the actions of the brain are suspended by pressure upon it: and the same will take place in an animal from which the cerebrum is removed, or in which its functions are completely suspended by a severe blow on the head. If the edge of the eyelid be touched with a straw, the lid immediately closes: if a candle be brought near the eye the pupil contracts;—if liquid be poured into the mouth it is swallowed:—if the foot be pinched, or burnt with a lighted taper, it is withdrawn, and if this experiment be made upon a frog, the animal will hop away, as if to escape from the source of irritation. *Carpenter's Animal Physiology*, p. 356.

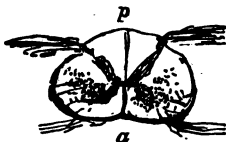
fibres destined for, or proceeding from the trunk to the brain, pass along the spinal cord, so that that organ is in great part no more than a bundle of nerve fibres going to and from the brain. These fibres are especially for sensation and voluntary motion. But in addition to these, there is another class of fibres proper to the spinal cord, and to its intercranial continuation which form a connection with the gray matter of the cord (15). Of these fibres some are afferent or incident, others efferent or reflex, and these two kinds have an immediate but unknown relation to each other, so that each afferent nerve has its proper efferent one, the former being *excitor*, the latter *motor*.—These fibres are quite independent of those of sensation and volition, and although bound up with sensitive and motor fibres, they are not affected by them, and they maintain their separate course in the nerves as well as the centres.”\* But this theory, however ingenious, is still but a theory; unsupported as yet by any anatomical proof, though the phenomena on which it is founded are established facts: it therefore awaits the confirmation, which perhaps we are never destined to attain, of a more accurate anatomical knowledge of parts so delicate in their structure, that they have hitherto in great measure baffled the inquirer. Before going further, however, it may be well to give what is known respecting the nature of the organ which plays so important a part in the animal economy.

15. “The spinal cord is somewhat cylindrical in shape, slightly flattened on the anterior and posterior surfaces,” and is considerably thickened in those parts where the nerves supplying the limbs are

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\* Todd and Bowman's Phys., vol. i. p. 323.

given off or received. It is divided down the middle "by an anterior and posterior fissure into two equal and symmetrical portions, of which one may be called the *right*, the other the *left* spinal cord. A transverse bilaminar partition, extending through the entire length of the cord, separates these fissures from each other, and serves to unite the lateral portions. This partition is composed of a vesicular or gray, and a white or fibrous lamina or *commissure*, the gray being situated posteriorly.—On further examination of a transverse section of the cord we observe that the interior of each half of it is occupied by vesicular matter, disposed in somewhat of a crescentic form, thus :



The concavity of this crescent is directed outwards, its anterior extremity or horn is thick ; but the gray matter is prolonged backwards in the form of a narrow horn, which reaches quite to the surface of the cord. The prolongation of the posterior horn of each gray crescent to the surface, divides each half of the cord into two portions. All that is anterior to the posterior horn is called the antero-lateral column, and this comprehends the white matter forming the sides and front of that half of the cord. The posterior column is situated behind the posterior horn of gray matter. The antero-lateral columns are united across the middle line by the anterior or white commissure ;—the gray crescent by the pos-

terior or gray commissure, while the posterior columns are not connected, except when the posterior fissure is imperfect or deficient. The roots of the spinal nerves emerge from the cord on each side along two lines; the posterior line corresponds to the margin of the posterior horn of gray matter; the anterior one is placed about midway between it and the anterior fissure. The roots of the nerves penetrate the substance of the cord, and are chiefly, if not entirely, connected with the antero-lateral column. So far as our present knowledge of the minute anatomy of the spinal cord extends, it is favorable to the supposition that the spinal nerves derive their origin, at least partly, from the gray matter. The longitudinal fibres of the cord may consist in part of fibres continuous with those of the brain or cerebellum, and in part, of commissural fibres, serving to unite various segments of the cord with each other, or to connect some part or parts of the encephalon with them. These fibres which may be regarded as strictly spinal, are probably oblique in their course, forming their connection with gray matter at a point higher up in the cord than that at which they emerge from its surface, and may readily be confounded with the longitudinal fibres when their course is long. Other oblique or transverse fibres probably do not emerge from the cord, but connect the segments of opposite sides, forming a transverse commissure. So that four classes of fibres, each different in function, may be considered to exist in the cord. 1. *Spinal fibres* oblique or transverse, which propagate nervous power to or from the segments of the cord itself. 2. *Encephalic fibres*; longitudinal; the paths of volition and sensation, which connect the spinal cord with the various segments of the encephalon. 3. *Longitu-*



*dinal commissural fibres.* 4. *Transverse commissural fibres.*

16. Whilst the functions which, till a better term is found, we must term *reflex* (14), were as yet either unknown, or considered merely as isolated and strange phenomena; the controversy was warm as to the respective offices of the posterior and anterior columns of the cord, as well as of the two roots of the nerves: but nothing would now be gained by going over ground, much of which has been abandoned, and I prefer quoting the following very rational theory, which will give a notion of the question as it at present stands. "We are much disposed to think," say the authors of "the Physiological Anatomy of Man," "that the antero-lateral columns are the centres of the main actions of the cord. Both roots of the nerves are connected with these columns, and therefore fibres of sensation and motion must be found in them. These columns are always proportionate to the nerves which arise from them; they enlarge when the nerves are large, and contract when the nerves diminish in size. The posterior columns, on the other hand, are of uniform dimension throughout nearly the entire length of the cord, although the posterior roots of the nerves exhibit considerable difference in point of size in different regions. We venture to suggest, that the posterior columns may have a function different from any hitherto assigned to them. They may be in part commissural between the different segments of the cord, and in part subservient to the function of the cerebellum (17), in regulating and co-ordinating the movements necessary for perfect locomotion. The analogy of the brain, in which the various segments are connected by longitudinal commissures, suggest the probable existence of fibres similar in

office for the spinal cord. If we admit such fibres to be necessary to insure harmony of action between the several segments of the encephalon, there are as good grounds for supposing their existence in the cord, which in reality may be regarded as *consisting of a number of ganglia, each a center of innervation to its proper segment of the body*, and therefore requiring some special connecting fibres to secure consentaneous action with the rest. The attribute of locomotive power rests upon the connection of the posterior columns with the cerebellum, and the probable influence of that organ over locomotion. If the cerebellum be the regulator of locomotive actions, it seems reasonable to suppose that those columns of the cord which mainly pass into it should enjoy a similar function; that, as they are the principal medium through which the cerebellum is brought into connection with the cord, it must be through their constituent fibres that the cerebellum exerts its influence on the nerves of the lower extremities, and of other parts concerned in the locomotive function.—We think that the phenomena of disease may be referred to in support of our view. In many cases, where the principal symptom has been a gradually increasing difficulty of walking, the posterior columns have been the seat of disease. In a remarkable case related by Dr. Webster, there was complete paralysis of motion in the lower extremities, but sensibility remained;\* yet there was com-

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\* Med. Chir. Trans., vol. xxvi. It had been maintained by Sir C. Bell in the first instance, that the posterior columns of the cord were the channels of *sensation*, as the cerebellum, in his opinion, was the seat of it; for the intimate connection of the two tend to make it necessary that their functions should be the same. The experiments of Flourens and Bouillaud disproved his views as to the functions of the cerebellum: it was then to

plete destruction of the posterior columns in the lower part of the cervical region. Similar cases have been put on record by Mr. Stanley, and by Dr. W. Budd. Dr. Nasse of Bonn, refers to several cases of the same kind, observed by himself or others.\* We have ourselves seen two cases in which the prominent symptom was great impairment of the motor power, without injury to the sensitive; yet the seat of organic lesion in both was in the posterior column of the cord. Such a case as that of Dr. Webster's, appears to us to be conclusive...that sensation may be enjoyed in the inferior extremities *independently of the posterior columns.*"—"Nevertheless we are not aware of any well-observed case, in which the motor power persisted after extensive lesion of the antero-lateral columns; on the contrary, we believe it may be laid down as the general rule, that lesion of those columns always impairs both the motor and the sensitive functions to an extent proportionate to the amount of morbid structure. Pathological observations, then, appear to warrant the conclusion, that the antero-lateral columns are compound in function, both sensitive and motor; but they do not justify us in attributing sensitive power to the posterior columns. The hypothesis, then, which we are most disposed to adopt, is the following:—That the *antero-lateral columns of the spinal cord with the gray matter*, are, in connection with the brain, the recipients of sensitive impressions, and volitional impulses, and that they are the centres of the independent or phy-

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be expected that sooner or later it would be found that the functions of the posterior cord were of the same nature as those of the organ with which it is connected so closely.

\* Untersuchungen zur Physiologie und Pathologie. Bonn, 1835-36.

sical nervous actions of the cord: and that the *posterior columns* propagate the influence of that part of the encephalon, which combines with the nerves of volition to regulate the locomotive powers, and serve as commissures in harmonizing the actions of the several segments\* of the cord."†

17. I have now briefly described the machinery of unconscious life:—first, we have the Sympathetic System (7), carrying on the functions of nutrition and secretion; the maintainer of vegetative life:—secondly, we have the Spinal Cord, and its dependent nerves, by which involuntary movements are effected, and to whose agency many of the actions termed instinctive may probably be referred; and thus far man and the animal creation stand on an equal footing, or rather the animal has the advantage; the spinal system of unconscious life being more complete, and less disturbed by other influences, than in man. We have next to consider that organ, or rather collection of organs which he possesses in an unrivaled degree of perfection, and by means of which all those complex mental operations are performed, which distinguish the human race from all the other inhabitants of the earth. The encephalon, or parts within the skull, may be distinguished into four chief divisions, i. e., 1. The *Medulla oblongata*.—2. The *cerebrum*. 3. The *cerebellum*. 4. The *mesocephale*.\* The following description of the position and connection of

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\* By a segment of the cord, must be understood the part from which one pair of spinal nerves proceeds. To each pair of nerves a ganglion or nervous centre is attached, on the posterior root: it is possible, therefore, that these ganglia may have a larger share than has yet been attributed to them, in the independent segmentary action here alluded to.

† Todd and Bowman's Phys., vol. i. pp. 319–321.

‡ From *μεσος*, middle, and *κεφαλή*, head.

the parts taken from the report made to the Royal Academy of Sciences at Paris, in 1822, by a committee appointed to consider the experiments of M. Flourens, may give some notion of the encephalon generally.

“It is at present known, that the *medulla oblongata* is the superior part of the spinal cord, contained in the cranium, which also gives many pairs of nerves; that the fibres of communication between its two fasciculi (the pyramidal bodies) interlace with one another, so that those on the right go to the left side, and reciprocally; that these fasciculi, after having been enlarged, in the mammiferæ by a mass of gray matter, which forms the prominence known by the name of *pons Varolii*, separate themselves and are called the *crura cerebri*, continuing to send off nerves. They are again enlarged by a new mass of gray matter, to form the parts commonly called *thalami optici*, and a third time to form those called *corpora striata*; and from the whole external edge of these last swellings arises a lamina more or less thick, more or less convoluted externally according to the species, covered entirely on the outer surface with gray matter, forming what is called the *hemisphere*. This lamina, after having bent back upon itself in the middle of the convolutions, unites on the opposite side by one or more commissures or fasciculi of transverse fibres, the largest of which, existing only in the mammiferous tribes, takes the name of *corpus callosum*. It is also known that on the *crura cerebri*, behind the *thalamus opticus*, are one or two pairs of swellings of different magnitudes, known, when there are two pairs, as in the mammiferous tribes, by the name of *quadrigeminal tubercles*, from the first of which the optic nerves appear to arise; that the olfactory nerve is the only one which evidently does not arise from the spinal cord or its pillars; that the

*cerebellum* as a single mass, white internally and cineritious externally like the hemispheres, but often more divided by external folds, is placed transversely, behind the quadrigeminal tubercles, and over the medulla oblongata, to which it is united by transverse fibres, which go by the name of *crura cerebelli*, and which are inserted into the *cerebellum* by the side of the *pons Varolii*.”\*

In order to make this description clearer, I shall here refer to a plate,† showing a longitudinal section

\* Solly on the Human Brain, p. 299.

† References to the plate, which is reduced from Quain's *Anatomy of the Nerves and Brain*, Pl. ix.

A. The internal convolutions of the right cerebral hemisphere.

B. The corpus callosum.

C. The anterior extremity of the corpus callosum turning downwards towards the base of the brain.

D. The posterior border of the corpus callosum becoming continuous with

E. The fornix.

F. The right crus of the fornix descending to

G. The corpus mammillare.

H. The band of white fibres passing from the corpus mammillare into the thalamus opticus.

I. The septum lucidum.

K. The crus cerebri of the right side.

L. The divided edge of the velum interpositum.

M. Section of the *pons Varolii* through which the ascending fibres of N. the corpus pyramidale are seen separated by gray matter, as they pass onwards to the crus cerebri.

O. The interior commissure of the third ventricle.

P. The middle commissure (commissura mollis).

Q. The posterior commissure.

R. The right thalamus opticus immediately beyond which and somewhat anteriorly lies the corpus striatum.

T. The pineal gland.

U. The corpora quadrigemina or optic tubercles.

X. The processus é cerebello ad testes.

Z. Section of the *cerebellum*, showing the arrangement of the white and gray matter called *arbor vitæ*.

1. Olfactory nerve.

2. Optic nerve of the right side.

3. Third nerve (motorius oculi).

of the cerebrum and cerebellum made perpendicularly between the hemispheres.

As some fibres pass between the medulla oblongata and the cerebrum, and others between it and the cerebellum, both are thus brought into communication with the spinal cord, between which and the above-named parts the medulla oblongata is placed. The mesocephale is the part immediately above the medulla oblongata, the pons Varolii forming its lower, the quadrigeminal bodies its upper surface. It "contains fibres passing between all the rest of the encephalon, as well as some connecting opposite sides," and "may be compared to a railway terminus, at which several lines meet, and pass each other."\*

18. "The whole brain of an adult man (a European) varies between 3 lbs. 2 oz. and 4 lbs. 6 oz. (troy) in weight. The higher grades of intellect being generally accompanied by a proportionate size of brain. Thus the brain of the celebrated Cuvier weighed 4 lbs. 11 oz. 4 dr. 30 gr. (troy), and that of the well-known surgeon Dupuytren 4 lbs. 10 oz. troy: while on the contrary the brain of an idiot 50 years old weighed only 1 lb. 8 oz. 4 dr., and that of another 40 years of age weighed but 1 lb. 11 oz. 4 dr." This great weight depends mainly on the cerebrum and cerebellum, the medulla oblongata and mesocephale forming not more than one-tenth of the whole.\* The observation made above by Tiedemann as to the relative proportion borne by the brain to the intellect, is farther confirmed by the fact, that animals of a much larger size than man have a much less brain; thus the largest brain

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\* Todd and Bowman's *Physiol.*, vol. i. p. 260.

† Tiedemann on the Brain of the Negro. *Phil. Trans.*, 1836.

of a horse weighs about 1 lb. 7 oz.—the elephant and whale, indeed, have a larger absolute weight of brain; but when considered with reference to the size of the body, it will be found that the proportion of brain is trifling as compared with that of man—an elephant has a brain of about 8 lbs., and “Rudolphi found the brain of a whale 75 feet long (*Balaena mysticetus*), to weigh 5 lbs. 10¼ oz. :”\* an enormous disproportion between bulk of body and weight of brain.

19. It has already been noticed that though the entire encephalon acts as one great nervous center, it must nevertheless be considered as an aggregate of various gangliform masses of vesicular and fibrous matter, united together by their respective commissures or connecting bands. Of these masses, the most important are the cerebral hemispheres, which occupy the whole upper part of the skull. A deep fissure, extending from front to back, separates these two bodies down to the great commissure or *corpus callosum*, which unites them through their whole length; and the whole surface, as well the sides of the fissure as the upper part, is deeply corrugated, so as to bear somewhat the appearance of a pocket handkerchief closely crumpled in the hand. “In man the convolutions of the right and left hemispheres do not present a perfect symmetry; and it is not a little remarkable, that in general the lower the development of a brain the more exact will be the symmetry of its convolutions. Thus the brains of all inferior mammalia, even of those which make the nearest approach to man, are exactly symmetrical. The imperfectly developed brain of the child exhibits a similar symmetry; and that of the inferior

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\* Todd and Bowman's Phys., vol. i. p. 261.



races of mankind, in whom the neglect of mental culture, and habits approaching to those of the brute, are opposed to the growth of the brain, also present a symmetrical disposition of the convolutions."\* Over the whole surface, and extending into the deep sulci of these convolutions, is spread a coating of gray vesicular matter, and as in the inferior animals the sulci are fewer, and of course the vesicular matter less abundant, it would seem that the object of these convolutions is, to pack the largest possible quantity of this important substance into the smallest possible space. The interior part consists of *white fibrous substance*, which is generally supposed to act as a conductor of the nervous energy generated in the *vesicular*. Behind and below these, so as to be connected by their overlapping lobes, we find the cerebellum or little brain. It "consists of a central and two lateral portions: the former also called the *median lobe*, is the primary part; it is the only part of the organ which exists in fishes and in reptiles; the lateral portions or hemispheres are additions to this, and denote an advance in development. It is in birds that these are first found; they are most highly developed in mammals, and attain their maximum in man."†

20. Having now given a general description of the organs which carry on the functions of life and intelligence, it remains to give a somewhat more detailed account of their machinery, and to prove from facts that such is really their office: and here we must enter into the melancholy details of disease and suffering. For as long as all the organs of our bodies continue to execute their functions duly, it is

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\* Todd and Bowman's *Phys.*, vol. i. p. 283.

† *Ibid.*, vol. i. p. 269.

difficult to say where the power is generated in that nicely adjusted machine. It is not till we see unwonted effects produced on the particular nerves by disease or violent injury, that we can distinguish their use. It is to the reports of the hospital, therefore, that we must refer for proofs of the different functions of the nervous fibres, and the influence of the brain over them: thus it may be noticed that in palsy, which results from an injury within the skull, the limbs of one side, or of the whole body, according as the injury is more or less extensive, are deprived sometimes of motion, retaining sensation; sometimes of sensation, retaining motion\*—that the division of one nervous trunk issuing from the brain will impede digestion; of another, will no less disorder respiration—that by a tumor in one part of the cavity of the skull, the moving power of one side of the face will be destroyed, so that the odd spectacle may actually be seen of a man laughing with only one side of his mouth; in another, the sensation on one side of the face will be so lost that the eye becomes insensible to the presence of offending substances, so that inflammation ensues from an unfelt injury, though at the same time the other eye retains all its sensitiveness.†

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\* See Solly on the Human Brain, Part viii.

† The following cases given by Sir Charles, then Mr. Bell, in a paper communicated to the Royal Society, and published in the Phil. Trans. for 1829, are so curious, and at the same time so conclusive, that I give them at length.

“By experiments on the nerves of the face three things were proved. 1st. That the sensibility of the head and face depends on the fifth pair of nerves. 2dly. That the muscular branches of the fifth were for mastication. 3dly. That the *portio dura* of the seventh controlled the motions of the features, performing all those motions, voluntary or involuntary, which are necessarily connected with respiration; such as breathing, sucking, swallow-

21. As a proof that sensation travels from the extremities of the body along the nerves to the brain,

ing, and speaking, with all the varieties of expression. The occurrences which I have witnessed are,

“ 1. A man shot with a pistol ball, which entered the ear, and tore across the portio dura at its root. All *motion* on the same side of the face from that time ceased, but he continued in possession of the *sensibility* of the integuments on that side of the face.

“ 2. A man wounded by the horn of an ox. The point of the horn entered under the angle of the jaw, and came out before the ear, tearing across the portio dura. The forehead of the corresponding side is without motion, the eyelids remain open, the nostril has no motion in breathing, and the mouth is drawn to the opposite side. The muscles of the face, by long disuse are degenerated, and the integuments on the wounded side are become like a membrane stretched over the skull. In this man the sensibility of the face is perfect. The same nerve,—the portio dura,—has been divided in the extirpation of a tumor from before the ear, and the immediate effect has been a horrible distortion of the face by the prevalence of the muscles of the opposite side, but without the loss of sensibility.

“ As to the fifth nerve the facts are equally impressive. By a small sacculated tumor affecting the roots of this nerve, the sensibility was destroyed in all the parts supplied by its widely extended branches; that is, in all the side of the head and face, and the side of the tongue, whilst the motion of the face remained. By the drawing of a tooth from the lower jaw, the nerve which comes out upon the chin to supply one-half of the lip was injured, and exactly the half of the lip was rendered insensible. When the patient put his mouth to a tumbler he thought they had given him a broken glass. A gentleman falling, a sharp point entered his cheek and divided the infra-orbitary nerve (a branch of the fifth); the effect was, loss of sensation without loss of motion in that half of the upper lip to which the nerve is distributed.

The following is from a previous paper by the same writer. “ To understand the inference from the following short narrative, it is necessary to remember that the nerve in question (the fifth) not only goes through the orbit (of the eye), supplying the parts contained in it, but also extends its branches to the angle of the eye, eyelids, and forehead. . . . A few days after the discharge from the ear had ceased, the eye became entirely insensible to the touch. This loss of feeling extended to the lining of the eyelids, to the skin covering them, and to the skin of

we may mention the fact that when a part containing the termination of any nerve is amputated, the pain felt in the extremities of the now-shortened fibres of that nerve is referred by the patient to the member which in their perfect state they supplied. Thus when a limb, for instance, has been cut off, the patient not unfrequently complains of pain in the fingers which he no longer possesses.\* It is not in fact till experience has taught us that a distinct sensation belongs to each point of the body, that we refer to that part as the seat of the feeling. "Under the name of common or general sensibility, may be included a variety of internal sensations, ministering for the most part to the organic functions, and to the conservation of the body. Most parts of the frame have their several feelings of comfort and pleasure, of discomfort and pain. In many of the more deeply seated organs, no strong sensation is ever excited, except in the form of pain, as a warning of an unnatural condition;" nay, it has been observed in the case of injuries which have exposed some of these deeply seated viscera, that the sense of touch appeared to be absent. It is remarkable that the sympathetic system of nerves sends one fibre of its own from each ganglion into the spinal system; and this it would seem, is the messenger by which notice is given at the mental center, of the unnatural condition into which any of the organs supplied by the ganglionic nerves may have fallen,

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the cheek and forehead, for about an inch surrounding the eye, but it did not go beyond the middle line of the face. When she (the patient) told me her eye was *dead*, (as she expressed it,) to be certain I drew my finger over its surface, and so far was this from giving her pain, that she assured me she could not feel that I was touching it at all."—*Phil. Trans.*, 1823, p. 291.

\* Muller, p. 746.

in order that, when this is the case, a remedy may be applied, so as to prevent the danger to life which would be consequent on its continuance.

22. Besides this general sensibility, whose proper organs are still a matter of uncertainty, there are five especial forms of sensation, each provided with its separate apparatus. It is hardly necessary to say that these are *touch, taste, smell, hearing, sight*. The nerves of touch are distributed over the whole surface of the skin, though some parts, such as the palm of the hand, and the sole of the foot, receive a larger portion of these fibrils than are found elsewhere. This sense "exists only in those regions of this great system which are exposed to the contact of foreign bodies, and where it is essential to the comfort or preservation of the animal that the presence and qualities of external objects should be perceived. Its nerves, unlike those of the other especial senses, which have their origin in the brain, are derived from the cerebro-spinal system, and intermingle, as they pass out, with those of motion. The extremities of these nerve fibrils pass through the true skin or *cutis* into small papillæ which project into, and are further defended by the cuticle, or scarf skin, which covers them. The furrows which may be observed in the skin are caused by rows of these papillæ which raise the cuticle, and leave a groove where it sinks into the hollows between them." These papillæ are of an average length, in man,—of  $\frac{1}{10}$  of an inch: at their base when they spring from the cutis they measure about  $\frac{1}{3}$  of an inch in diameter, and they taper off to a slightly rounded point." Within them "a fibrous structure is apparent," and by the help of solution of potass "filaments of extreme delicacy are discoverable. Injections of the blood-vessels demonstrate the exist-

ence of a small arterial twig advancing up the interior of the papilla and subdividing into two or more *capillary vessels*: these, after forming small loops, re-unite either at the base of the papilla, or in the subjacent texture, into small veins which empty their blood into the venous plexus of the cutis. The vascularity of the integument is therefore in general terms proportioned to its perfection as an organ of touch.”\*

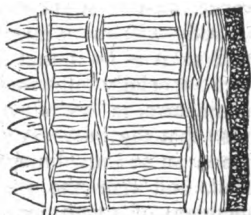
23. It has already been seen that it is difficult to separate the nerves of touch from those of general sensation, even in imagination, and yet there are not a few phenomena of sensation quite independent of this especial sense: pain especially; which continues to be felt after the sense of touch is lost by palsy, and which affects parts to which these nerves are not distributed. The only set of nerves which are invariably to be found where pain is felt, are those of the sympathetic system; for these belong especially to the viscera, and send out twigs which cling to all the arteries: thus it is impossible to wound any part of the body without injuring some fibre of this system: and as it is to it that the functions of vegetative life are especially entrusted, it is perhaps allowable to conjecture, in default of actual proof, that it is to it also that the business of giving notice of any derangement in or impediment to these functions is confided, and that the general sensation which is independent of touch, may be referred to these nerves.

24. The structure above described is in great measure that of all the other nerves of especial sense, which are limited to their respective organs, i. e., the nostrils, mouth, eyes, and ears. Each of

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\* Todd and Bowman's *Physiol.*, vol. i. pp. 404, 410, 411.

these organs has its own nerve assigned to it, which receives and transmits the impressions belonging to that particular sense and no other. Every surgeon knows that the needle of the operator for cataract produces only the perception of a flash of light when it touches the fibrils of the optic nerve, and that pain and sensibility to touch remain after the optic nerve itself has perished. The like may be observed of all the other nerves of especial sense. So far therefore is clear enough; but the *mode* of conveying impressions is more mysterious, and it is not improbable that we may never arrive at more than a conjectural explanation of it. The optic nerve, when observed with a powerful magnifier, appears to be formed of innumerable minute fibrils which pierce through the delicate membrane at the back of the eyeball, called the retina, and show themselves on its surface, for the most part in the form of small globules or papillæ easily detached, and which appear to close the ends of the hollow fibres. The



PORTION OF THE OPTIC NERVE MAGNIFIED.

auditory nerve has something of the same appearance, though the fibres are less minute than those of the optic nerve, and the points which show themselves on the membrane they penetrate, differ slightly from these in their form. It seems probable that

both these nerves are destined to receive impressions from different undulatory movements, the one conveying the sensation of light, the other of sound; and though it would be presumptuous to say that the *modus operandi* can be certainly or distinctly stated, yet a very simple illustration may perhaps give some notion of it to those who have not time to pursue the study further. When a hollow tube is filled with liquid, the slightest pressure at one end is instantly perceived at the other. If, then, as modern observers assert, the nerves be hollow fibres filled with a half fluid substance which may be seen issuing from them if divided, then it is easy to comprehend that the impression made at one end of the fibril may be conveyed through every fibril connected with it down to the extremest point of the motor nerves. What the difference of structure is, which makes this impression in the one instance convey colors, in another sounds, and, when propagated further, produces that irritation of the muscles which causes movement, has as yet eluded observation; but it is evident from the result, that some decided difference must exist. Time was, indeed, when "the nerves of the senses were looked upon as mere passive conductors, through which the impressions made by the properties of bodies were supposed to be transmitted unchanged to the sensorium. More recently, physiologists have begun to analyze these opinions. If the nerves are mere passive conductors of the impressions of light, sonorous vibrations, and colors, how does it happen that the nerve which perceives is sensible to this kind of impression only, and to no others, while by another nerve odors are not perceived; that the nerve which is sensible to the matter of light or the luminous oscillations, is insensible to the vibrations of sonorous bodies; that the



auditory nerve is not sensible to light, nor the nerve of taste to odors; while, to the common sensitive nerve, the vibrations of bodies gives the sensation, not of sound, but merely of tremors? These considerations have induced physiologists to ascribe to the individual nerves of the senses a special sensibility to certain impressions, by which they are supposed to be rendered conductors of certain qualities of bodies, and not of others.

“This last theory, of which ten or twenty years since no one doubted the correctness, on being subjected to a comparison with facts, was found unsatisfactory. For the same stimulus, for example, electricity, may act simultaneously on all the organs of sense,—all are sensible to its action; but the nerve of each sense is affected in a different way, becomes the seat of a different sensation; in one, the sensation of light is produced; in another, that of sound; in a third, taste; while in a fourth, pain and the sensation of a shock are felt. Mechanical irritation excites in one nerve a luminous spectrum; in another a humming sound; in a third, pain. An increase of the stimulus of the blood causes in one organ spontaneous sensations of light; in another, sound; in a third, itching, pain, &c.” It is evident, therefore, “that the nerves of the senses are not mere passive conductors, but that each peculiar nerve of sense has special powers or qualities which the exciting causes merely render manifest.”\*

25. It has been noticed above, that the immediate vital functions are carried on by the sympathetic system. In like manner, the nerves of special sense seem to be connected with the instinctive emotions.

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\* Müller's Elements of Physiology, translated from the German by William Baly, M. D. Sec. iv. chap. 1.

Any accurate observer of animals may soon convince himself of this. Without insisting on the complete exactness of the illustration just given of the mode in which these nerves convey the impressions they receive, it may at least afford a point of view from whence to contemplate the operations of instinct. An organ made, not only to receive, but to propagate a particular sensation, receives it; the shock is sent in a moment through the less complete, or, as in the case of the savage, the less exercised brain to the motor nerves, and movement ensues as a necessary consequence. According to Mayo, there is no evidence that animals exert any volition beyond this necessary contraction of the muscles consequent on received sensation. If so, the actions which we choose to call ferocious, crafty, cowardly, &c., among the brute creation, are wholly undeserving of this blame. They are feelings inseparable from perceptions conveyed by the organs of smell, sight, and hearing, and necessary to the sustenance and the safety of the creatures which possess them.

26. But the actions which the emotions consequent on these perceptions instigate, are, in many instances, exactly such as intelligence would suggest. The young calf seeks the udder as soon as it is born, but it is evident that he is merely led thither by the sense of smell; for instead of at once reaching the spot, he pushes his nose awkwardly hither and thither, and it is only when his mouth is touched, and the nerves of another sense thus excited, that he begins to suck. The movements of a lamb following its mother, of a dog hunting its prey, of a bird building its nest, result in the same way from impression on the nerves of sense.

But although the animal actions we have mentioned, when their nature is considered, seem to be as

intelligent as if human reason had instigated them, it may easily be proved that the sagacity from which they proceed is extremely limited in its extent. For whenever any cause leads the animal to transgress those bounds, it is then seen at once how different reason is from instinct. Such is the case of a puppy when rubbing its nose on a brick floor to bury a bone: of a hen sitting on a stone instead of an egg; such likewise was the case with the beavers which Frederick Cuvier kept in a cage. These animals, on being supplied with materials, employed themselves in building that particular structure which, essential as it is to their existence when at large, and in their natural state, was then utterly without use or meaning.

27. The obvious conclusion from hence is, that, whatever faculty the instinctive impulse elicits, is incapable of advancing beyond a certain point in this class of creatures, and is unserviceable for any other act of intelligence. “*Cette pensée qui se considère elle-même, cette intelligence qui se voit et qui s’étudie, cette connaissance qui se connaît, forment évidemment un ordre de phénomènes déterminés d’une nature tranchée, et auxquels nul animal ne saurait atteindre. C’est là, si l’on peut ainsi dire, le monde purement intellectuel, et ce monde n’appartient qu’à l’homme. En un mot, les animaux sentent, connaissent, pensent; mais l’homme est le seul de tous les êtres créés à qui le pouvoir ait été donné de sentir qu’il sent, de connaître qu’il connaît, et de penser qu’il pense.*”\*

28. But though the animal intelligence, with whatever labor it may be cultivated, be unfit for

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\* *Resumé analytique des Observations de Frédéric Cuvier sur l’Instinct et l’Intelligence des Animaux. Par P. Flourens, p. 55.*

any speculative purpose, this defect is compensated for by its fitness for practical purposes without any previous exercise. The cause of this is the comparatively small compass of apparatus connecting sensation with action in the lower tribes; and as they are thus in great measure exempt from the painful apprehension of danger, and from perplexity at the time that it occurs, it is in their case decidedly beneficial. In man, the relations between the sensitive and motor fibres of the nerves issuing from his brain are liable to be confused with those of higher intelligence, in consequence of the more complicated functions of that organ. This structure of his nervous system exposes him to inconvenience and hazard, which other animals are exempt from. The dizziness produced by looking down a precipice is known to every one; were we to try to cross a chasm on a narrow plank, we should be very apt to lose our balance and fall, if unused to the situation; yet we should walk steadily along the same board placed on the floor. In this case it is evident that our real condition would not be changed; but that the danger would arise entirely from the difference in the perception received by the eye and communicated by it to the organs of intelligence. It may be observed that throughout the animal kingdom this timidity seems to increase with the degree of intelligence belonging to the creatures placed in such situations. Goats and ibexes stand at the edge of precipitous rocks, and gaze fearlessly on the depths beneath; but the carnivorous animals, which are more intelligent\* than the ruminating tribes, show considerable alarm when exposed to this danger, though on other occasions they are more courageous.

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\* Flourens.

Cats, for example, though accustomed to climb, are frightened and unsteady when put on the bough of a tree at any considerable height, and there can be little doubt that the instability of the human frame, under the circumstances described, is augmented by the disturbed state of the reasoning faculties arising from foreseeing the probability that our alarm will increase. I am also inclined to think that where the disturbance in the functions of the motor fibres is not caused by fear, it arises from the want of some near and steady object, by looking at which we may adjust the body so as to poise it duly. A distant horizon with no intermediate near object, such as it is in looking from a precipice; or a rapid current, does not afford this, and we falter. And this possibly is one cause of reeling in drunkenness: the functions of the optic nerve are disturbed by the unwonted pressure of blood on the brain, and everything appears to be in motion: accordingly, having nothing steady before him, the drunkard reels. The narrowest ledge on the side of a precipice may be crossed safely, by looking steadily at the rock beside us, instead of at the chasm below.

29. Before quitting this part of the subject, it will be well again to observe, that the fibrils which converge from every part of the body, from the trunks of the nerves, never in any instance unite with each other. Thus every one carries its report from the part which receives the impression, distinctly and separately to the brain; and, as the white substance of that organ, in whatever form it appears, is also composed of minute fibres sustained and clothed by a most delicate membrane, so we have good reason to suppose that the sensation carried by the finest fibril from the remotest part of the body, is communicated to its own especial fibril in the brain, and

through it duly transmitted to the corresponding motor fibre.

30. But another circumstance is here to be observed.\* The sum of all the fibrils in the nerves does not by any means amount to the volume of the brain even in the lower order of animals; still less in man, in whom, though the volume of the brain be proportionally greater, the nerves are less; thus there must be many fibres destined to some other purpose than that of mere conductors of sensation. But it is likewise remarked that they have a plexiform arrangement; and thus the simple fibril of sensation, though not mixing with any other, may nevertheless, by its intercrossing, communicate whatever shock it may receive through a different series of nerves, and so give rise to those varieties of action which sometimes excite our surprise when we see them in the brute creation, because they seem to partake of the nature of reason. But if the reasoning faculties be, as I shall presently show, the mere function of an organ, then, in proportion as that organ is developed, its properties will also be developed, and it is at the option of the will which directs them to make those properties available, or not, to other and higher purposes than those relating to mere animal life. I have already noticed that we have no proof of any will in the *animal* beyond the mechanical one resulting from a shock transmitted through the nervous circle. Of the will of *man*, as it belongs to a second class of functions, I shall speak by and by.

31. It has already been observed, that the brain consists of various portions, which may be con-

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\* On Fibres of Spinal Marrow and Sympathetic in *Rana esculenta*. Dr. A. W. Volkman, Brad. Med. Rev., vol. vii. p. 541.

sidered as separate ganglia, each probably having a different function, though hitherto but few of these functions have been ascertained. Of these gangli-form masses the cerebral hemispheres take the first place in the importance of their office—the cerebellum probably takes the second, and next to these, perhaps we may reckon the corpora striata and optic thalami, for a lesion of either of these bodies is invariably attended with palsy of the limbs, so that they appear to play an important part among the animal functions. Both consist of gray vesicular matter. It has been attempted to decide with more certainty on the office of these bodies; and palsy of the lower extremities has been attributed to lesions of the one—of the upper, to the other;—but these conjectures have not as yet been sufficiently borne out by facts to warrant further notice. The functions of the corpora quadrigemina, or optic tubercles, are better defined, at least as far as the experiments made on pigeons by M. Flourens can be considered to apply to other species. In every case he found that injury to the optic tubercle on the one side, produced blindness of the eye on the opposite side; establishing thus a complete decussation of the fibres; and according to his report, the removal of these parts was attended with little or no pain. With regard to the office assigned to the other small ganglia and lesser commissures, no very clear account can be given, for their proximity to other parts renders it impossible that the injury should be confined to them alone: and thus symptoms become complicated, and puzzle and embarrass the observer.

32. The function of the cerebellum was long a matter of dispute, no less hot than that respecting those of the different columns of the spinal cord, and even now in following the opinion of any one

of the contending parties, I shall hardly escape altogether from animadversion. Sir Charles Bell and M. Foville, observing its connection with the posterior column of the spinal cord, considered it as the organ of sensation—this opinion, however, was subsequently abandoned by Sir Charles Bell, who then professed himself unable to assign any office to it. The subject was then taken up by M. M. Majendie, Bouillaud, and Flourens, especially the latter, and after a variety of experiments, always producing the same results both in his own hands and those of the physiologists who have since repeated them, it seems now to be allowed that the deductions drawn from them by M. Flourens are nearly conclusive, and that this body must be considered as the organ by which action is co-ordinated and harmonized in the animal frame; or, in other words, that it is the organ of voluntary action, as distinguished from the involuntary or reflex action of the spinal nerves. M. Flourens removed from different birds in turn the cerebral hemispheres and the cerebellum. On the ablation of the first, sight and hearing seemed to be lost, and the animal appeared without faculties; remaining as it were dormant, originating no movement, but if pushed, able then to use its limbs in the usual way; but when the cerebellum was removed the results were very different, and it may be well also to mention, that in neither one nor the other case did the wounds of these parts appear to give any pain.\* “During the ablation of the first slices,” (of the cerebellum), say the committee above referred

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\* “The hemispheres of the brain are insensible to pain from mechanical division or irritation: in wounds of the cranium in the human subject, pieces of the brain which had protruded, have been removed without the knowledge of the patient.” Todd and Bowman’s *Physiol.*, vol. i. p. 368.



to (17), "only a little weakness and a want of harmony in the movements occur. At the removal of the middle slices an almost general agitation is the result. The animal, continuing to hear and to see, only executes abrupt and disorderly movements. Its faculties of flying, walking, standing up, &c., are lost by degrees. When the cerebellum is removed, the faculty of performing regulated movements has entirely disappeared. Placed on its back the creature could not get up; yet it saw the blow that threatened it, it heard noises, it endeavored to avoid danger, and made many efforts to do so without accomplishing its object. In brief, it retained the faculties of perception and of volition, but it had lost the power of making its muscles obey its will. It was with difficulty that the bird stood up, resting upon its wings and tail. Deprived of its cerebrum it was in a dormant state; deprived of its cerebellum it was in a state of apparent drunkenness." M. Bouillaud differs a little from M. Flourens, but not to any great extent. "Up to this time," says he, "experiments only warrant us in saying that the cerebellum is the central nervous organ which gives to vertebrated animals the faculty of preserving their equilibrium, and of exercising the various acts of locomotion. Besides, I think I have proved in another memoir, that the cerebellum co-ordinates certain movements, those of speech in particular, more marvelous than those of which we are here treating."—"If" he adds, "the cerebellum is only irritated, its functions are not destroyed, but are thrown into confusion, if I may so express it, for a certain time. It is in this state that we observe jumping, falling heels over head, whirling, and all the puzzling movements which are executed with such impetuosity that the eye cannot follow them. But this disorder, this

species of *alienation* of the locomotive movements, soon disappears when the irritation is not continued; so that the animal gradually regains its proper attitude and normal gait. It is not so when the cerebellum is totally disorganized or entirely removed; the animal is then forever deprived of the faculty of equilibration, of walking, and of flying, if a bird; all the efforts it makes are useless; they merely demonstrate that though unable to perform any combined motions, out of which station or locomotion results, it nevertheless retains the faculty of exercising partial movements.”\*

33. A curious case is on record, which confirms this view of the functions of the cerebellum as regards the human species. On the post-mortem examination of a girl, who died at near twelve years of age, it was found that “the cerebellum was entirely wanting, nothing being found in its place but a quantity of serous fluid contained in the membranes;—a pedunculated body, not larger than a pea, was attached to the corpora restiformia; all the rest seemed replaced by the serous sac; the pons Varolii was absent, as well as the cerebellum.”—In this instance, it would seem that the malformation must have been in great measure congenital, for had it been caused by subsequent injury, the shock to the constitution generally would have been too great to allow of the prolongation of life, even to the age she attained. The degree of mental and bodily power enjoyed by this child, becomes therefore a question of no small interest. “The intellectual faculties,” continues the writer,† “were obtuse, though not to

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\* Bouillaud, *Recherches cliniques et expérimentales tendant à refuter l'opinion de M'Gall sur les fonctions au cervelet.*—Cited by Solly.

† Andral.

a remarkable degree; the answers slow and difficult; the whole countenance expressive of stupidity: in a word, the child, though not exactly idiotic, still showed a deviation of the mental powers. The motility was also modified; the power of motion was considerably weakened in the lower limbs, which did not possess their natural force and vigor; hence the child was unable to support itself with any firmness: it fell down frequently; the legs crossed each other during walking, and the gait was irregular and unsteady. At length the child was compelled to confine itself altogether to bed, and after some time was unable to stir, even when lying in a horizontal position;—to this were joined epileptiform convulsions, which continued for some time, and finally carried off the patient. The sensation of the integumental covering was not modified in any way whatever. There was no increase of sensibility in the commencement, no obtuseness or diminution of feeling, even when paralysis was most complete; the senses also remained intact. The child could see, hear, and taste in a perfect manner. The functions of nutrition, of circulation, and respiration were carried on without any notable disturbance.” However, the child is mentioned as being weak and delicate in constitution.

34. The progress of development in the brain of infants affords a farther confirmation of the view taken by M. Flourens, of the functions of the cerebellum in co-ordinating the voluntary movements. “That this power is mental, i. e., dependent on a mental operation for its excitation and exercise,” observe the authors of the *Physiological Anatomy of Man*, “is rendered probable from the experience of our own sensations, and from the fact that the perfection of it requires practice. The voluntary movements of a new-born infant, although perfectly

controllable by the will, are far from being co-ordinate; they are on the contrary remarkable for their vagueness and want of definition. Yet all the parts of the cerebro-spinal centre are well developed, except the cerebellum and the convolutions of the cerebrum. Now the power of co-ordination improves earlier and more rapidly than the intellectual faculties; and we find in accordance with Flourens' theory, that the cerebellum reaches its perfect development of form and structure at a much earlier period than the hemispheres of the cerebrum." From all this it seems clear that the cerebellum is requisite to the execution of all pre-arranged movements, and in proportion as the cerebrum increases in bulk and complexity, the cerebellum receives a similar augmentation, so that they would seem always to have a certain relation to each other. After demonstrating what are the functions of the cerebrum, I shall return to the mutual relation of the two.

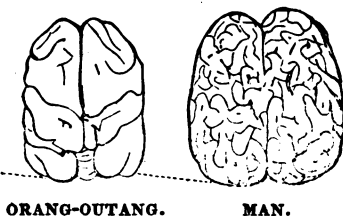
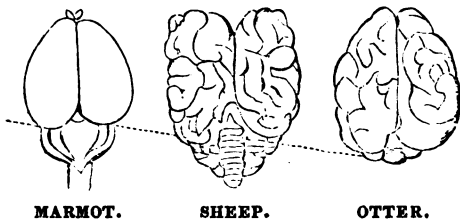
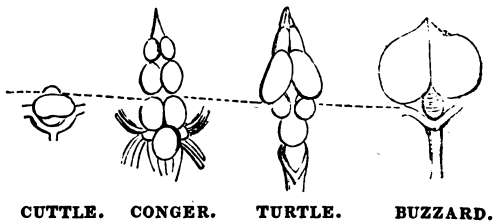
35. The proof of the function of any organ must be of two kinds; first, it must be demonstrated that when the function is performed in its greatest perfection, the organ is proportionably developed: secondly, it must be shown that a lesion of this organ impairs the function which it is supposed to fulfill. Both kinds of proof may be given, that the functions of the cerebral hemispheres are those of intelligence. The following sketch shows the proportion which these bodies bear to the rest of the encephalon in different classes of animals: the part above the dotted line is that which answers to the cerebral hemispheres.

It is evident therefore as has been remarked\* by

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\* Owen on Structure of the Brain in Marsupial Animals, Ph. Tran. 1834, p. 358—1837, p. 89.

physiologists, that the development of the hemispheres of the brain proceeds step by step with the development of intelligence through the successive classes of the animal kingdom till it arrives at perfection in man. "Who has not seen," says Dr. Fletcher,\* "artificially educated horses, dogs, lions,



\* Physiology, Part III. p. 89.

pigs, elephants, bears, monkeys, canary-birds, and even hens; but who has ever seen, or ever will see, an educated worm or oyster? The educability of animals, then, or in other words their intellect, is in proportion to the size and composition of their brains." Thus, of all animals, man, who has the largest and most complicated brain is the most improvable; he can judge, compare, discriminate, and remember all the impressions made on his senses with far more precision than any other of the mammalia. This was to be expected from the structure of his brain, which differs in many points from all others; but here a most important fact presents itself. With the development of the brain in the animal, proceeds also its intelligence; but the individuals of each class retain a close resemblance to their common type; the greatest difference that can be produced by education between the wild and the domesticated animal is so small as scarcely to be worth the notice; since it consists in little else than a sensation of fear impressed by the felt power of man: but when we look at the human race, so great is the difference between civilized and uncivilized man, that some physiologists have endeavored to find in the brain of the latter a resemblance to the quadrumana rather than to his more cultivated brethren. Yet there is no perceivable distinction in the cerebral organs of individuals constituting the most clearly defined varieties of the human race. Whether civilized or uncivilized, male or female,\*

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\* "Although Aristotle has remarked that the female brain is absolutely smaller than the male, it is nevertheless not relatively smaller compared with the body: for the female body is in general lighter than that of the male. The female brain is for the most part even larger than the male, compared with the size of the body.

we find the same component parts, the same relative proportion of brain. Whence then the immense difference between the negro in his African wilds, and the European philosopher?

36. I think some of the points I have endeavored to establish will in great measure explain this. Every bodily fibre acquires strength by exercise: none need be told how much muscular power is acquired by a constant and moderate exertion: the practised eye will see, the practised ear hear, what these organs when unpractised distinguish with difficulty; it is not wonderful then, if the practised brain can also carry on its functions with greater facility and increased power. In savage life, where subsistence is hardly obtained, and where danger is always at a point that keeps the emotions which guard existence in constant exercise, men who have to struggle for their daily food, and defend themselves from their no less daily perils, require from the brain but a very small part of what it *can* accomplish: their greatest stretch of reasoning extends not beyond the connecting a bent twig, or a down-trodden leaf, with the steps of their prey or their enemy. In such instances, we

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“The different degree of susceptibility and sensibility of the nervous system seems to depend on the relative size of the brain as compared with that of the body. Children and young persons are more susceptible, irritable, and sensible than adults, and have a relatively larger brain. The degree of sensibility in animals is also in proportion to the size of the brain. Mammalia and birds have a larger brain and are more susceptible than amphibious animals.

“The brain of a negro boy 14 years old weighed, according to Sæmmering, 3 lbs. 6 oz. 6 dr. troy. The brain of another handsome tall negro about 20 years of age weighed 3 lbs. 9 oz. 4 dr. troy. Sir Astley Cooper gives the weight of the brain of a large negro 49 oz. The general weight of the brain of man is from 37 to 52 oz.”—*Tiedemann on the Brain of the Negro*, Phil. Trans., 1836.

may easily conceive that the unexercised faculties become as powerless as the limb of an animal which from the moment of birth had been restrained from movement. A child who had grown up with a limb so disabled, would not be aware of its use unless he saw it exemplified in others, and even if he saw its use, he would still find that in his own case the effort to make it available would be perfectly vain.

37. Such I conceive to be the state of the brain which has never been called to exercise the higher faculties. The instinctive emotions are propagated through it with the almost delirious violence which characterizes the brute creation, because the fibres destined to carry on the higher reasoning functions have remained inert till they have become powerless, and man is thus assimilated to the lower tribes, not because the organ of thought is wanting, but because it has not been exercised. Christophe, the negro ruler of Haiti, was probably not removed above a generation or two from the African savage, yet his daughters were polished and accomplished women, fit to take their place in European society. A better proof could hardly be given of the improvability of all the races of men by education, even in *one* generation.

38. It now remains that I give the second part of my proof, and show that a lesion of the cerebral hemispheres impairs the functions they are supposed to fulfill, *i. e.*, that of intellectual perception. And here I must notice that a considerable analogy may be traced between the arrangement of the brain and that of the organs of special sense. Thus as we have two eyes, two ears, two nostrils: so we have also two hemispheres of the brain, and we may remark as a consequence of this, that a serious injury, amounting nearly to the removal of one hemisphere,



does not necessarily abolish the functions of thought, any more than the loss of one eye or the failure of one ear produces absolute blindness or deafness. I have heard an instance of a young boy who was dashed on the ground by a fall from his horse, with such violence as to shiver one side of his skull, and a large quantity of the brain, nearly amounting to the magnitude of one hemisphere, actually issued from the wound. When this youth had recovered, he was so far from manifesting any want of intellect, that he attained considerable proficiency in mathematics. This case runs parallel with that of persons who have gone on for a considerable time deriving their sight from one eye, and quite unconscious that they had not the use of the other. Such cases are to be met with frequently in medical books; and it appears from what has been observed with regard to animals, that "where a portion of the brain is removed, its place is supplied by new matter; but whether this becomes true cerebral substance," it is added by the writers already frequently quoted, "future researches with good microscopes must determine."

39. The actual removal of a portion of the cerebral hemispheres may take place, therefore, without ill consequence, unless inflammation should follow in consequence: but compression, which prevents the movement of the fibres, and consequently the transmission of impressions, produces total insensibility. "Sir A. Cooper used to relate in his lectures on surgery one of the most interesting and unique cases on record. A man was pressed on board one of his majesty's ships early in the late revolutionary war. While on board this vessel in the Mediterranean he received a fall from the yard arm, and when he was picked up he was found to be insensible,

The vessel soon after making Gibraltar, he was deposited in a hospital in that place, where he remained for some months, still insensible; and some time after he was brought from thence to a depôt for sailors at Deptford. While he was at Deptford, the surgeon, under whose care he was, was visited by Mr. Davy, who was then an apprentice at this hospital: the surgeon said to Mr. Davy, 'I have a case which I think you would like to see. It is a man who has been insensible for many months; he lies on his back with very few signs of life; he breathes, indeed, has a pulse, and some motion in his fingers; but in all other respects he is apparently deprived of all powers of mind, volition, or sensation.' Mr. Davy went to see the case, and on examining the patient found a slight depression on one part of the head. Being informed of the accident which had occasioned this depression, he recommended the man to be sent to St. Thomas's Hospital. He was placed under the care of Mr. Cline, and when he was first admitted into the hospital, I saw him lying on his back, breathing without any great difficulty, his pulse regular, his arms extended, and his fingers moving to and fro to the motion of his heart, so that you could count his pulse by this motion of his fingers. If he wanted food he had the power of moving his lips and tongue; and this action was the signal to his attendants for supplying this want. Mr. Cline on examining his head found an obvious depression; and thirteen months after the accident he was carried into the operating theatre, and there trephined. The depressed portion of the bone was elevated from the skull. While he was lying on the table motion of his fingers went on during the operation, but no sooner was the portion of bone raised than it ceased. The operation was performed

at one o'clock in the afternoon; and at four o'clock, as I was walking through the wards, I went up to the man's bedside and was surprised to see him sitting up in his bed. He had raised himself on his pillow. I asked him if he felt any pain, and he immediately put his hand to his head. This showed that volition and sensation were returning. In four days from that time the man was able to get out of bed, and began to converse; and in a few days more he was able to tell us where he came from. He recollected the circumstance of his having been pressed, and carried down to Plymouth or Falmouth; but from that moment up to the time the operation was performed (that is, for a period of thirteen months and some days), his mind had remained in a perfect state of oblivion. He had drunk, as it were, the cup of Lethe; he had suffered a complete death as far as regarded his mental and almost his bodily powers; but by removing a small portion of bone with the saw, he was at once restored to all the functions of his mind, and almost all the powers of his body."\*

40. When death supervenes from furious mania, it is usually found on examination that the cortical substance is in a state of inflammation if not of gangrene. The following cases are selected from the records of the hospital of La Salpêtrière at Paris. "A woman of advanced age but strong constitution was brought to this hospital October 20, 1821, by order of the police. She was in a state of extreme and furious agitation; her eyes were brilliant, her exclamations violent: her delirium was upon all subjects, but there were no means of ascertaining what had been the cause or what the commencement of this

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\* Selly on the Human Brain, p. 334.

attack of furious mania. For six months it continued without the least interval of calm; but on March 13, 1822, this woman, so restless the evening before, was stretched on her bed without the power of rising: she was calm, her face pale and yellow, her eyes fixed and half open, her head bent to her left shoulder, her respiration stertorous, her pulse hard and quick. At night she had again a paroxysm of violence during which she struggled and fell out of bed. The next day the symptoms were still more serious, her whole left side was paralyzed; on the third day the stupor increased and in the night she died.

“The post-mortem examination presented the following appearances. The cranium itself was much injected with blood of a dark color: the meninges were healthy, but raised by a considerable quantity of serous fluid beneath: when the membrane was removed, the periphery of the organ was found much injected with blood, and the gray matter when carefully examined was of a scarlet color in the upper convolutions, and marked here and there with dark spots (ecchymoses) in the lateral convolutions. These dark spots penetrated through the white substance beneath; and the center of the right hemisphere, and especially the corpus striatum,\* were entirely disorganized. The posterior lobe of this hemisphere was wholly converted into a greenish-purulent matter which escaped on the removal of the membrane and left a considerable cavity, the sides of which were covered with small pieces of disorganized white and gray matter. The left hemisphere, though much injected with blood, had suffered

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\* Palsy follows almost invariably on a lesion of this part, which lies beneath the hemispheres.

no disorganization." Here it is evident that the mania had been the result of the inflammation which had at last terminated in gangrene, and which, when it reached the corpus striatum, produced paralysis, of the contrary side as usual. In another case in the same hospital we find a woman after an attack of furious mania gradually losing her memory, till at last she sunk into a state of utter imbecility. She died about seven years after her admission, and on examining the brain, it was found that the convolutions of the hemispheres had entirely coalesced into an even surface, over which a very thin layer of gray matter was spread. The white medullary matter was changed from a soft substance into a strong elastic fibre, which admitted of being torn into long strips, and offered considerable resistance to the knife of the operator.\* Examples of this kind might be multiplied from the records of La Salpêtrière, but as they all present nearly the same appearances of inflammation and gangrene, with induration of the white matter if the inflammation has continued long previous to the fatal termination,—it seems needless to quote more. Two other cases of rather a different nature may be added from other sources: the one of a person possessing enough of recollection to be employed in trifling commissions, but idiotic in regard to connection of ideas: whose brain was found on examination to be without the great transverse band which unites the two hemispheres: and a third where, in an idiot girl who died at fifteen years of age, the two anterior lobes, the parts, namely, which form the front of the hemispheres, were entirely wanting: indeed, in all cases of idiocy, the brain has been found exceedingly small in size, and generally

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\* Pinel, Jun. *Physiologie de l'Homme*.

but slightly convoluted; for it would seem that this part of the brain only acquires its full size and importance when the cultivation of the mind has called it into activity. In early childhood the convolutions of the brain are very imperfectly developed, and their increase in size goes on simultaneously with the advance of mental power—if this increase be impeded, or if some congenital defect prevent the further growth of the convolutions, the mental powers are of the lowest and feeblest kind;”\* and as this important period, in which the organs for future use can be fashioned and enlarged, terminates at about the seventh or eighth year, some notion may hence be formed of the cruel wrong done to the individual if these precious years, in which the future sage or hero is to be prepared for his work, be suffered to pass without culture and without that rational exertion of the higher faculties which alone raise the human animal above the brute. When the brain and the skull can receive no further development, it is late to begin the work of rational education, and he is happy whose mother has not merely sung the lullaby of his infancy, but has laid the foundation also of future greatness, by gently exercising the faculties which call the material organ into exercise without over-tasking it; affording it the full play requisite to its development without the unhealthy strain of school lessons while the young brain is too tender to bear it.

41. It would not be difficult to multiply cases where either original imperfection or subsequent injury of the cerebral hemispheres has caused either idiocy or madness; but perhaps a more remarkable proof yet of the office of the brain may be found in the circumstance that a slight degree of inflammation

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\* Todd and Bowman's Phys., vol. i. p. 363.

† Solly on the Human Brain, p. 370.

is attended by an extraordinary increase of the vividness of the ideas and the general powers of the mind. In two cases which have been mentioned to me, where I can have no doubt as to the fact, persons previously of rather weak intellect, during an access of what is called brain fever, suddenly acquired a mental force which abandoned them again on recovery; and a friend who has suffered more than once from transitory inflammation of this part has assured me that during the severest paroxysms of pain, the gratification at the immense power of mind thus acquired, almost counterbalanced the suffering.

42. Something of the same kind occurs under the stimulus of wine. A more than ordinary circulation of blood is promoted by it; the brain partakes of the excitement, and the imagination and the emotions are thus mechanically rendered more vivid; but when pushed to excess the vessels become overloaded, and if carried a step further, apoplexy and death ensue. There is indeed no symptom of drunkenness which does not run parallel with those of diseased brain; from the exaltation of faculties in the early inflammatory stage, to the utter senselessness of the fatal termination.

43. With these facts before us, and the\* hundreds of others that might be added to them, it would be difficult to avoid the conclusion that recollection and the power of combining ideas, or what are usually termed the reasoning faculties, are as much a function of the hemispheres of the brain as sight or hearing are of the optic or auditory nerves; nor can I better sum up this part of my subject than in the words of the authors already frequently quoted.† “Thus

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\* Müller, B. III. sec. v. p. 835. Fletcher, Part III. p. 100.;

† Todd and Bowman's Phys., vol. i. p. 364.

anatomy leads to the conclusion that the operations of the mind are associated with the convolutions. These parts, in the language of Cuvier, are the sole receptacle in which the various sensations may be as it were consummated, and become perceptible to the animal. It is in these that all sensations take a distinct form, and leave lasting traces of their impression; they serve as a seat to memory, a property by means of which the animal is furnished with materials for his judgments. When the membranes of the brain are in a state of inflammation, disturbance of the mental faculties is an invariable accompaniment, to an extent proportional to the degree of cerebral irritation, and more especially so when the inflammation is seated in the pia mater of the convolutions. It is plain that in such a case the delirium arises from the altered state of the circulation in the gray matter of the convolutions, the blood-vessels of which are immediately derived from those of the pia mater, so that one cannot be affected without the other likewise suffering. We learn from the most trustworthy reports of the dissections of the brains of lunatics, that there is invariably found more or less disease of the vesicular surface, and of the pia mater and arachnoid in connection with it, denoted by opacity or thickening of the latter, with altered color or consistence of the former. From these premises it may be laid down as a just conclusion that the convolutions of the brain are the *center of intellectual action*, or more strictly, that this center consists in that vast sheet of vesicular matter which crowns the convoluted surface of the hemispheres. Every idea of the mind is associated with a corresponding change in some part or parts of this vesicular surface; and

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\* The covering membranes.



as local changes of nutrition in the expansions of the nerves of pure sense may give rise to subjective sensations of vision or hearing, so derangements of nutrition in the vesicular matter of the surface, may occasion analogous phenomena of thought, and the rapid development of ideas, which, being ill-regulated, or not at all directed by the will, assume the form of delirious raving. The action of the convoluted surface of the brain, and of the fibres connected with it, are altogether of the mental kind. The physical changes in these parts give rise to a corresponding manifestation of ideas; nor is it likely that any thought, however simple, is unaccompanied by change in this center."

44. It has already been seen that the cerebellum in animals acts as the co-ordinator of movements, so as to rationalize them as it were;—and having now traced the functions of the cerebral hemispheres in man, it is easy to perceive that a more complete organ would be requisite for the execution of its mandates. Accordingly we find the cerebellum proportioned to its work; and the most difficult movements are arranged and executed with the most beautiful precision in compliance with the directing will: yet as the movements which result from thoughts which have previously been propagated through the cerebrum, are in some cases slow, a provision has been made for the safety of the animal by the spinal apparatus, whose nerves act independently of the mind, and whose movements are carried on at times unconsciously, and always without requiring attention. Thus the start which avoids danger precedes the deliberate precaution which might come too late. Whoever has noticed the difference between walking on mechanically, or picking his way for a smooth or clean path, will comprehend

what I mean by the two different kinds of action. In manual operations, too, which are carried on from habit, such as executing a piece of music by rote, the slight pause which occurs if the performer recollects himself suddenly, and turns his attention to the music, shows that thought is slower than the mere habitual action which probably is carried on merely by the nerves immediately in connection, and goes no further perhaps than the segment of the spine in which they are imbedded. Should M. Bouillaud's conjecture that the movements of speech also, are arranged through the medium of the cerebellum, prove well founded—and this is in some degree supported by the case given above (33), where “the answers were slow and difficult,” and by the fact that in infants the power of speech is absent while this part remains imperfect,—we shall at once see a cause for its large size as compared with all other parts, excepting those charged with the yet more important functions of thought.

45. We have now traced the machinery by which man is a living, a sentient, and an intelligent animal. We will next proceed to investigate what may be called the elementary functions of intellectual man: and these may be divided into two great classes, distinguished by their causing or not causing bodily change by their exercise. They may be thus arranged in a tabular form.

I. Functions sharing in or causing bodily change:

1. Appetites and functions appertaining to life—Sympathetic System.
2. Instinctive emotions—Nerves of sense and medulla oblongata.
3. Faculties—Hemispheres of the brain.

II. Functions neither sharing in nor causing bodily change:

1. Individual consciousness, including the memory which this requires.
2. Intelligent will.

It cannot be disputed that a vital appetite, such as hunger, or that an instinctive emotion, such as fear or grief, or that the exertion of such faculties as those used in abstract reasoning, are attended with bodily change. Thus, an unsatisfied appetite causes uneasiness; or an instinctive emotion while the body is under its full influence, sometimes acts as an antagonist to appetite, as when grief subdues hunger by deranging the digestive powers. Sometimes the emotion interferes with the most delicate operations of the sympathetic system, as when fear or joy, which necessarily arises from an impression on some nerve of sense, affects the action of the heart through the medium of the connecting links between the spinal and sympathetic nerves; there is then a sensation as of a blow or compression of the chest: or when yawning tells of the general weariness of mind and body. Here a particular nerve acts on the diaphragm, the respiratory muscles are tuned in accordance with this by other nervous fibres connected with it at its origin, and the impulse is propagated through the whole of these muscles. Again, whoever has ever devoted his hours to severe study is most probably well acquainted with the headache and weariness which result from it, showing plainly that bodily organs have been employed in the process.

46. I cannot pass over this part of the subject without drawing from it one useful lesson upon the necessity of cultivating the higher faculties far more than is yet done even among races calling themselves civilized. If the instincts, or as some will call them, *passions*, assume so undue an ascendancy in conse-

quence of the inertness of the antagonist part of the brain, that man's whole moral nature falls into the morbid state of a convulsed, or finally a contracted limb, it is then no light crime in those who have the government of a family or of a society of human beings, if they suffer the young to grow up without duly developing the full powers of a nature so admirable where its mental growth is duly proportioned,—so tremendously capable of evil when it is not.

47. A man is not to be considered as educated because some years of his life have been spent in acquiring a certain proficiency in the language, history, and geography of Greece and Rome, and their colonies, or in bestowing a transient attention on the principles of mathematics and natural philosophy; nor is a woman to be considered as educated because she can execute a difficult piece of music in a brilliant style, or speak French, German, or Italian with fluency. Such attainments require little more than mere mechanical recollection,—the lowest of all the cerebral faculties, or the rapid transmission of an impulse from the sensitive optic nerve to the motor ones of the arms and fingers, which is nothing better than the instinctive movement of the animal: neither can the storing up the opinions of others, or the accustoming the tongue to the idioms of other languages, be properly termed an act of thought: for in such cases the capacity of combining ideas, of weighing and judging ere a course of action is adopted, remains even less exercised than in those who, though they are turned into the world with the mind as it were a *tabula rasa* to receive any impression, and too frequently a bad one, yet amid the difficulties and sufferings of poverty, sometimes learn to think. It is from the depths of man's interior life

that he must draw what separates him from the brute, and hallows his animal existence; and learning is no farther valuable than as it gives a quantity of raw material to be separated and worked up in the intellectual laboratory, till it comes forth as new in form and as increased in value, as the porcelain vase which entered the manufactory in the shape of metallic salts, clay, and sand.

48. I have before alluded to the notion of some physiologists that the negro formed but the connecting link between the baboon and man. This has been so fully refuted by Professors Tiedemann\* and Owen,† that it is needless to go into it at length; but I mention it here to give a further instance of the necessity of cultivating the mind, even to give the bodily frame its due development, and the duty therefore, which even political economists must acknowledge, of bestowing on all the power of doing so. Dr. Pritchard, in his researches into the physical history of mankind, quotes a fearful instance drawn from the early history of Ireland, of the deterioration consequent on such a degree of poverty and suffering as reduces man to a merely instinctive existence.

49. "On the plantation of Ulster," says the writer, "and afterwards on the successes of the British against the rebels of 1641 and 1689, great multitudes of the native Irish were driven from Armagh and the south of Down, into the mountainous tract extending from the barony of Flews eastward to the sea; on the other side of the kingdom the same race were expelled into Leitrim, Sligo, and Mayo. Here they have been almost ever since exposed to the worst effects of hunger and ignorance, the two great brutal-

\* Phil. Trans., 1836, p. 497, &c.

† Trans. Zoo. Soc., vol. i. p. 368.

izers of the human race. The descendants of these exiles are now distinguished physically from their kindred in Meath and in other districts where they are not in a state of physical degradation. They are remarkable for *open, projecting mouths*, with prominent teeth and exposed gums. Their advancing cheek bones and depressed noses bear barbarism in their very front. In Sligo and the northern Mayo, the consequences of two centuries of degradation and hardship exhibit themselves in the whole physical condition of the people, affecting not only the features, but the frame, and giving such an example of human deterioration from known causes, as almost compensates, by its value to future ages, for the suffering and debasement which past generations have endured in perfecting the appalling lesson. Five feet two inches on an average, pot-bellied, bow-legged, abortively featured, these spectres of a people that were once well grown, able-bodied, and comely, stalk abroad into the daylight of civilization, the annual apparitions of Irish ugliness and Irish want. In other parts of the island, where the population has never undergone the influence of the same causes of physical degradation, it is well known that the same race furnish the most perfect specimens of human beauty and vigor both mental and bodily."

50. If such be the effect under our own eyes of reducing man to the lowest point at which he can maintain even a mere animal existence, we may well believe that ages of such a state may have stamped many of the characters of the brute creation on the human countenance in the wilds of Africa. The great difference between the skull of the negro and the European consists in the wide opening for the nose, which by its greater spread affords more room for the development of the olfactory nerve; and we

may add to this, the form of the jaw again approximating to the animal in its projection, though not in its other characters. We may probably read in these peculiarities the history of generation after generation doomed to a merely instinctive existence, as well as we read sensual indulgence in the thick, moist, swelled lips which so frequently characterize those who give themselves up to such a course of life.

51. It is almost needless to observe, after what I have already said, that it is to the surplusage of fibres in the brain over and above the quantity requisite for the transmission of sensation to the appropriate motor fibre, that we must trace not only the power of reasoning, but all the finer flights of imagination and wit. The agent of which I shall now presently have to speak, appears able at will to reproduce the impressions once received through the medium of the nerves of sense, and it is amid the novel combinations of the fibres thus called into action, that all those wonders of thought are produced which have won our admiration through all ages. That such is their origin may be proved by the fact, that the most brilliant imagination never yet produced anything which had not been seen, heard, or felt, as it were piecemeal: the combination is new, but the material thus woven afresh is what all are acquainted with.

52. WE have now traced the human animal through all parts of his structure: we have shown first a system of ganglia and nerves springing from them, by means of which organic life is carried on, and appetites excited for its maintenance: we have further seen a set of nerves whose terminations are to be found at the base of the brain, which supply the senses by which man communicates with the exter-

nal world: we have seen another apparatus within the cranium by which these sensations are weighed and examined, and the result of this examination transmitted finally to the motor nerves for execution; altogether forming the most perfect piece of machinery ever constructed: for these nice operations of thought are the work of fibres and fluids contained in them merely set in motion by the impression made at one part, and thus transmitted through the whole series. Let us now consider the actions of this animal.

53. The first instinctive impulse is to preserve life. Look at a wrecked vessel! There is one man there ordering and directing all on board: the only remaining boat is lowered; he is careful to see it filled with the persons crowded about him,—it pushes off, and where is he? He is there on the deck of that sinking ship; the boat would not hold *all*, and he has refused a place in it, and remained to perish rather than sacrifice one life committed to his charge. He knows that death awaits him: he has been urged to save himself, and yet he is there! What is the impulse which prompts him thus to contravene the first great law of animated nature?

54. Sleep again is among our most imperious needs, for the want of it gradually destroys life. There lies a sick man in his bed, senseless,—in the last stage of an infectious fever: and there is one watching beside him, looking pale and exhausted, but who sleeps not, stirs not, though her young life is wasting away with fatigue, and exposed to contagion: and she knows it, and has calculated that the same grave will receive both! What nerve of all that fine machinery has impelled her to this course?

55. Look at the Astronomer in his observatory! The night is far advanced, and he is chilled and



fatigued; yet he remains with his eye at the telescope—for what? To carry on a series of observations which perhaps in two generations more may give as its result the knowledge of some great law of the material universe: but he will be in his grave long ere he can expect that it will be ascertained. He sits down to his calculations, and he forgets his meals, sees nothing, hears nothing, till his problem is solved! No sense prompts him to this sacrifice of rest and comfort. But do we call these persons insane? No—we honor them as the excellent of the earth: admire their lives, and wish that when the occasion comes, we may have courage so to die.

56. I know but of one solution of the difficulty; there must be some element in man which we have not yet taken account of; some untiring, undying energy which eludes indeed the fingers and the microscope of the anatomist, but which exercises a despotic sway over the animal mechanism and takes possession of it for its own use, to the point of exhausting and finally destroying it. Nor is it any objection to this view, that there may be instances either of congenital idiocy or subsequent injury of the brain, where this power is less manifested; for we are not wont to judge of the peculiar characters of a species from the anomalous exceptions. The power which overmasters and despises sense is yet obliged to convey its mandates through bodily organs; take these from it, either wholly or in part, and it can no longer manifest its existence in the same way as when these organs were perfect. The paralytic man would move his arm or would express his wishes if his arm or his tongue would obey him; and his frequent impatience at their incapacity sufficiently shows that the ruling will and the servant

faculties are of a different and distinct nature: nay, it has been observed that even the insane are at times conscious of and lament a state of brain, which no longer enables the individual to act rationally. This could not occur, were the brain and nerves as acted upon by external stimuli, the only spring of man's will; for then the altered structure would invariably produce a satisfied acquiescence in its results.

57. It will easily be seen that if we acknowledge a distinct acting principle in the above cases, we cannot in any other involve it in the accidents of the body: in sleep it voluntarily abandons the senses to the repose they need, and resumes the use of them when it chooses, for who does not recollect how, when the weary body required repose, he has *forbidden* thought, in order to allow the senses to fall into the state of torpor necessary to recruit their vigor? And there are few, probably, who have not also experienced how easily sleep, which would otherwise have lasted for a much longer period, may be curtailed by the resolution to awake at a particular hour. In death,—whatever be the cause that exhausts the muscular irritability so far as to make it no longer sensible to the usual stimuli, the cessation of that living action at once stops the machine. It is in vain that the musician touches the keys, if the strings be broken; but we do not thence argue that the musician has ceased to exist; nor have we more reason to conclude that the principle which claimed the powers of the living body for its own use, has ceased to exist, because the instrument it required to make its presence apparent is out of order or destroyed.

58. The philosopher, when he sees an effect produced, seeks for the cause: the chemist, if he finds

two apparently similar substances which under the same test exhibit different phenomena, thinks *that* a sufficient cause for considering them different in nature, and gives them separate names. If, then, effects occur in man which are not sufficiently accounted for by any known bodily organism or impulse—if under the same circumstances he acts as no other animal would act, we must either on this occasion throw aside all our usual modes of reasoning, or we must pronounce that man differs essentially from all other animals, and has a cause of action not to be sought for in nerves and muscles. That cause may be invisible; so is the wind: imponderable; so is electricity: intangible; so is light, if the one organ fitted to receive it be disabled: it is therefore no new thing to find an existing agency of potent efficacy which as far as regards our senses is invisible, imponderable, and intangible. What we call it, matters not; it is evidently superior to, and master of the body: it has other objects in view, other pleasures, other hopes; and to attain these it compels its slave to undergo privations, pain, and death.

59. I have already referred to the table where the phenomena of man's nature are reduced to two classes: those whose exercise either causes, or is attended by, bodily change, *i. e.*, emotion, fatigue, or painful exhaustion—and those, which though incessantly manifested, produce no sense of weariness whatever. It is certainly among the last of these that we must look for this unknown and potent cause: accordingly we find, that the two unchanging functions noted in this table are exactly those which would give rise to such actions of the human animal, as I have described. These functions or attributes are, a consciousness of individuality independ-

ent of the bodily frame, which talks of the limbs and the faculties as *its property*, not *itself*; and an intelligent and indomitable will, forming an essential attribute of that individual existence. It is this persevering and remembered will, acting frequently in opposition to the animal nature, which it is my object to claim as the distinguishing characteristic of man; as the manifestation of another nature, differing in attributes from and superior in energy to the mere bundle of muscles, nerves, and blood-vessels which we see before us, and which it rules so despotically. A moment's reflection will show us, that the memory inseparable from the exertion of this individual and intelligent will, is perfectly distinct from that faculty of common recollection with which it may at first be confounded. This latter, like all the other faculties of *the brain*, has its infancy, its maturity, and its decline; is strengthened by exercise, impaired by disease, enfeebled by entire repose; but the memory necessary to individual consciousness and will, is perfectly insusceptible of fatigue, increase, or diminution; and when palsy or age has taken away the recollection of persons, of events, and of words even, the memory of individuality requisite to the exertion of will remains as strong as ever; and the impatience usually attendant on such a state is perhaps one of the strongest proofs, that the organs are the servants, not the cause, of the intelligent will.

60. We have already seen how far the volition which is the result of a shock sent through the nervous circle can go: it amounts to little more than a blind instinct, for the animals which possess this apparatus in common with man, are incapable of education beyond a certain point, and that education is only to be effected by the fear of pain or expectation of food. The poverty of language is always a

great hinderance in philosophical researches, and here it is particularly felt; for we have but one word to express this instinctive will of the animal and that lofty prerogative of man which defies the influence of sense, despises the small globe it inhabits, roams over space to find objects great enough for its contemplations; and amid worlds upon worlds which multiply on our view as art prolongs it, still feels dissatisfied, and requires nothing less than infinity for its contemplation—immortality for itself.

61. If we look through nature, we shall find that the happiness of the organized being consists in the accomplishment of its end of existence. Animals, while supplied with food, and propagating their kind, are happy: their span of life is long enough for all the enjoyments they require: but man's life is insufficient for his wishes, and these gross pleasures disgust and weary him. Where is *his* happiness, then? We have seen it! The captain of the wrecked vessel feels his heart swell with proud delight as he awaits death with a consciousness of having done what, if he were an animal only, would be an act of the wildest insanity. The fair girl, before whom all the pleasures of life were smiling, despises them, and finds her joy in dying with the object of her affections, because she *feels*, even if she does not argue, that thus they will still be united. The astronomer has no greater delight than to pursue knowledge which affords him neither fame nor profit; though it be only to be gained at the expense of fatigue at any rate, and probably of health.

62. These are the pleasures of a being whose nature has other ends than that of merely spending seventy years in eating, drinking, and sleeping, in the pleasantest way, and leaving other beings so to eat, drink, sleep, and—die! Nor is it merely a few

that thus feel: the consciousness of a higher destiny is so rooted in man, that even the savage brands *him* with disgrace who seeks to preserve life at the expense of what he may deem honor, and the name of a coward is the worst of reproaches. There is scarcely any cause so slight that man will not risk his life for it: can we then with any common show of reason assert that sensation alone is *his* source of action? That risk of life brings no pleasure unless it be a mental one: he rises in his own esteem by so doing, and, it may be, in the esteem of others; but he does so only because, by despising base life, he has made good his claim to a higher nature.

63. We have asked, what is man's destination? I reply from these facts—immortality. We have asked, what is the ultimate object of his existence? I am not here allowed to enter on the higher ground which would make the chain of reasoning complete; but if we allow that this rare piece of mechanism is not created by the cause that impels it; and no *man* has yet succeeded in imitating the smallest portion of organized matter; then a higher intellect must have produced it, and I can hardly be wrong in assuming that the intelligence which planned such a scheme of being, planned it not in vain; and that man is not the sport of circumstance, filled by his very nature with evil desires which it is his business to uproot: but that the invisible essence, which we have found so decidedly manifesting its existence in the midst of its bodily trammels, is placed in such a situation as to be improved, not deteriorated by, the companionship. He cannot alter the function of one fibre of a nerve even; it would be tyranny were he called upon to do so; but he can regulate and balance their action, and find those very functions which he can never alter, those very propensities

which he can never subdue, because they are requisite to his existence as an animal,—sources of enjoyment and of virtue.

64. I am forbidden here\* to enter on the nature of the only other intelligent will which we have any cognizance of, but this much I may be allowed to say,—that like natures must have like enjoyments. We have seen that all animated nature seeks the end of its being, and is happy in attaining it: if man then be akin to that ruling will which both he and the universe own as Lord, the ultimate object of his existence must be a like happiness, and we can figure none to ourselves for such a being but pure benevolence and perfect knowledge. Let me here be allowed to borrow the words of a philosophical writer to whom I am already indebted for many of the views I have this evening propounded: I can hardly give a better summary of the practical results of the whole system. “Thus,” says the writer, “we see two kinds of animal functions mutually balancing each other, uniting to school the individual will to all that is amiable and exalted; the instinctive emotions softening the sternness of the faculties; the faculties curbing the animal force of the emotions: and the will, impelled by the solicitations of the one, and guided by the information and caution of the other, acquiring by degrees those habits of judging and feeling rightly which qualify man for the spiritual felicity of his Creator. He has learned the enjoyment of benevolence and the excellence of knowledge, and his heaven is already begun on this side the tomb; and thus, though these emotions and these faculties may cease with the bodily mechanism which

\* The rules of the Royal Institution confine the lecturer to scientific subjects.

causes them, they have stamped their impress on the individual. Like metal poured from a furnace into a mould, which retains forever the form so acquired, though the mould be but of earth; the soul has acquired the character it will carry with it into eternity, though the mould in which it was cast be returned to its dust."—*Philosophical Theories and Experience*, p. 74.

THE END.





**SMALL BOOKS ON GREAT SUBJECTS.**

**EDITED BY A**

**FEW WELL-WISHERS TO KNOWLEDGE.**

**No. III.**



ON  
MAN'S POWER OVER HIMSELF  
TO  
PREVENT OR CONTROL  
INSANITY.

COMMUNICATED TO THE MEMBERS AT THE ROYAL INSTITUTION  
OF GREAT BRITAIN, ON FRIDAY EVENING,  
MAY 26TH, 1843.

BY  
THE REV. JOHN BARLOW, M. A.,  
OF TRINITY COLLEGE, CAMBRIDGE,  
SECRETARY OF THE ROYAL INSTITUTION OF GREAT BRITAIN, F. R. S., ETC.

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## ADVERTISEMENT.

**THE** history of this little book is identical with that of "The Connection between Physiology and Intellectual Philosophy," which I published last year.

Each of these volumes contains the substance of a communication made to the members of the Royal Institution, at one of their Friday evening Meetings.

Both are offered to the public at the desire of many who were present on those occasions; and I may add with respect to the work now in the reader's hands, that the President of the Institution was pleased to require its publication.

Both this book and its predecessor owe not only their origin, but large contributions of material, and great assistance in their composition and arrangement, to a Society of intimate friends with whom I have the honor to be connected. Both may therefore be regarded as the effects of a confederacy whose object, as already declared, (vid. Advertisement to "Connection, &c." p. vi.) is "to bring philosophy into a form that might benefit the mass of mankind, instead of being the mere luxury of a few learned men."

For whatever success may have attended the former publication, I cannot but be much indebted to the favorable judgment pronounced upon it by the most eminent physiologists of this country, to whom I desire to express, on behalf of those with whom I am allied, as well as on my own, our sense of the encouragement afforded by them to our enterprise.

*Henrietta Street, Cavendish Square,  
London, June 18, 1843.*

## ON MAN'S POWER OVER HIMSELF TO PREVENT OR CONTROL INSANITY.

### I.

1. Two years ago, I had the honor of submitting to you some views with regard to intellectual science, which appeared necessarily to result from recent discoveries in anatomy.—Now it is the property of all scientific views if true, that they announce a few simple principles which admit of an extensive practical application; and I endeavored to apply this test to the theory I then brought forward as to the dual nature of man. I asked myself how it bore on that most terrible of all diseases connected with the brain—madness; and I found that wise and good men, even without thinking of the theory, had practically applied it in the treatment of maniacs; whose intelligent will they had roused to a certain degree of self-control by a system of kind and rational treatment, instead of the chains and whips of former times. Still, if I might credit the assertion of a gentleman whose experience gives him a claim to attention, Dr. Thomas Mayo, though facts were accumulated, an hypothesis, which should give these facts, the character of results from great principles, was wanting:—and I asked myself further, if a theory, which coincided with the views of so many men illustrious in science, might not have enough of the characters of truth to supply the desideratum which Dr. Mayo points out.



2. In order to make myself clearly understood, it will be necessary to take a brief view of the structure and functions of the brain and nerves as explained in my former communication. This apparatus consists of exceedingly minute hollow filaments, filled with a semi-fluid substance. These filaments are either compressed into a mass, as is the case in the brain and those brainlike structures called ganglia—or else extend from the brain down the back, as *spinal marrow*; and from thence they are distributed to the remotest parts of the body in the form of *nerves*: some employed in carrying intelligence to the brain, others in executing its mandates.

3. The vital functions, which go on unconsciously and unceasingly, are regulated by a peculiar set of nerves, extensively, though indirectly connected with the brain and spine. They are united into a separate system by means of numerous ganglia; and in color and texture they bear the same resemblance to the gray matter of the brain and spine, that the spinal nerves and those of especial sense do to the white matter: though even in these ganglionic nerves, as they are called, white filaments are perceivable, derived from the spinal marrow. These will account for the influence exercised over the vital functions by the distributing force which we shall presently have to notice, as well as by any sudden shock to the brain or spine. The circulation of the blood is under the immediate charge of the ganglionic nerves, one of which accompanies every blood vessel. The nerves of smell, sight, hearing, and taste, are derived immediately from the brain, as are those which regulate the movements of the face, and some of the upper portions of the body. The nerves of touch for the most part communicate with the brain through the spinal marrow, as do the larger portion of the

motor nerves also:—nevertheless much of the movement which ensues on the excitement of the nerves of sensation, is effected without the intervention of consciousness, as is seen in palsy, where movements are caused by touch, though the patient is unconscious of it. In the lower orders of animals, where the brain is almost, or wholly wanting, the movements seem also to be mechanically propagated from one set of nerves to the other.

4. In the human species a portion of the brain, which begins to develop itself in the higher order of animals, assumes a preponderance over the rest. I mean the hemispheres—which fill the upper part of the skull. Less immediately connected with the nerves of sense, this part has its own peculiar function: and I formerly brought examples to prove that this function is that of thought.\* I then took occasion to notice a peculiar force found in man, which is capable of assuming a control over this portion of the brain; and, through it, over the greater part of the bodily functions—a force whose agency, as Professor Liebig has well observed, is “entirely distinct from the vital force, with which it has nothing in common,”† but in so far as it is viewed in connection with matter, manifests itself as an acceleration, a retarding, or a disturbance of the “processes of life.” We find therefore, as this acute observer goes on to state, “two forces in activity together, namely the mechanical-vital force—or, as he terms it, *vegetative life*, and the source of the higher phenomena of mental existence, which is of a perfectly distinct, and so far a superior nature, that it is able sometimes to exercise a dominion over the vital force

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\* Vide No. II. of Small Books on Great Subjects.

† Liebig's Animal Chemistry, p. 5.

which nullifies its action; and at all times controls and modifies it.

5. In my former communication, I called your attention to a Table\* arranged so as to exhibit the functions of these two forces, whose existence it was my purpose to establish. I hardly then anticipated that I should find my views supported by such men as M. Jouffroy in France, and Professor Liebig in Germany, but such being the case, I feel the less diffidence now in bringing forward a theory, where, if I err, I err in such good company.

6. In the two great divisions of this Table, I have placed side by side the two great forces which manifest themselves in the phenomena of man's nature. The VITAL FORCE by virtue of which he is an animal—and INTELLECTUAL FORCE by virtue of which he is something more. Throughout nature we find the advance to a higher grade of being, made by addition rather than by change. The power of assimilation is added to chemical affinity, and we have organized life as in vegetables; but set in motion by external causes: nervous matter is added in the animal; and vegetative life proceeds still unconsciously, but by means of a main-spring within the body; and this lowest kind of life is found, as I formerly observed, in the rooted zoophyte no less than in man. It forms the first subdivision of the Table. Nerves of sensation and of movement are added, and the animal becomes locomotive, and is impelled by a feeling of pain or of pleasure to the acts needful for the maintenance of vegetative life: and this state of being is marked in the second division. Then the hemispheres of the brain are developed in addition, as in the class mammalia, and the animal seeks its object

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\* Small Books, &c. No. II. p. 35.

by contrivance and by suiting the means to the end. Finally, as in the great step from inorganized to organized matter, a fresh *force* is added, not superseding, but availing itself of the other; and man steps forth a denizen of two worlds, and capable of an advance which he can set no limit to.

7. Such is the constitution of man. When in healthy action, we cannot easily figure to ourselves anything better calculated to produce the most admirable results than the reciprocal influence of the different parts and forces of this complex being: but in proportion to the variety of parts is the danger of derangement: and our business to-night is not to consider man in his normal, but in his abnormal state. I shall therefore now endeavor to apply the theory, which I have just given a brief abstract of, to practical use, first by giving a classification of the different kinds of mental derangement, and next by considering how far the immense power of the Intellectual force can in any case be applied to their prevention or cure. I prefer the term *mental derangement* to that of *Insanity*, because it will embrace all departures from the normal condition of man, as far as the functions of the brain are concerned: and I conceive (herein following the great authority of Dr. Conolly\*) that a certain degree of mental derangement may exist without constituting insanity in the usual sense of that word.

8. I propose to classify mental derangement thus:

I. Morbid affections of the nervous system and brain.

1. Morbid affection of brain caused by derange-

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\* Vide An Inquiry concerning the Indications of Insanity. By John Conolly, M. D.

ment of the sympathetic system, of inflammation, &c.

2. Morbid affection of the nervous system producing delusions as to sight, sounds, &c.
3. Morbid affections of the hemispheres of the brain producing loss of memory, &c.

## II. Morbid affections of the Intellectual force.

1. *Inefficiency*, where either the appetites or instinctive motions, &c., are left wholly uncontrolled.
2. *Misdirection*, where delusions of sense are reasoned and acted upon.
3. *Occultation*, where the organs of thought are impaired or wanting.

9. It will be readily seen that a force which is capable of acting as an acceleration, a retarding, or a disturbance of the vital functions, must have no small influence over so delicate an organ as the brain; and accordingly we find paralysis, inflammation, or brain fever, and a variety of other diseases of this kind, produced in many instances by causes purely mental—I need hardly give cases; they will occur readily to the recollection of every one.—Now a force which can produce disease, must have some power also in removing or preventing it; and my business to-night will be to endeavor at least, to mark out how far this force can be made available to so desirable an object. In this attempt to establish true principles where they are so much needed, I have had large assistance. To Dr. Conolly, Dr. Webster, and Mr. Samuel Solly, I must beg thus publicly to tender my cordial thanks; as well as to many others who have aided my views in various ways: indeed I can claim no merit to myself but that of an earnest desire to fulfil my part of the great duty which every human being is sent into the world to perform; and

in which, if we knew "what belonged to our peace," we should find our happiness too. It is not in the pursuit of fame or of profit that a man finds his noblest employment, though these may advance to meet him in his unshrinking career: it is in the being, as it were, the vicegerent of the Deity on earth, and spreading peace and comfort around him, that he carries out the intentions of his Creator: and I know of none who have fulfilled that great mission better than some of those I have alluded to. Though in many instances struggling against prejudice and neglect, they have nearly carried their point, and rescued a large portion of their fellow creatures from a state of the most hopeless misery.

10. But to return—I have said that mental derangement and madness are different things:—thus a person may fancy he sees others around him who have no existence, as in the well-known cases of Nicholai of Berlin and Dr. Bostock.\* This is a certain degree of mental derangement while it lasts; but as both soon satisfied themselves that these personages were merely the creation of a morbid physical state, they were not mad. A man of less resolution would have shrunk from the labor of convincing himself that he was fooled by his senses, and would have insisted that the figures were real, and then he would have been mad. On these cases Dr. Conolly very justly remarks—"Let any one reflect how Nicholai preserved his reason under such visionary and auditory delusions for so many months; and why the English physiologist, though visited with the images which are so well known to be familiar with mad people, never lost the use of his excellent understanding. The ready answer will be

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\* Vide Appendix A.

'they never believed in their real existence.' But why did they not? and why does the madman believe in their real existence? The evidence of both is the same—the plain evidence of sense. The explanation must be this. The Printer of Berlin and the Physician in London retained the power of comparison: they compared the visual objects of delusion with the impressions of other senses," and the perceptions of other persons, and became convinced of their unreality. "This is exactly what madmen cannot do. One form of madness consists in this very illusion of sense, but it is conjoined with the loss or defect of the comparing power, and the madman concludes that what is only an illusion is a reality. But the illusion is not the madness." Thus, according to the opinion of this very able judge, the affection of the brain which causes these delusions, *is not* madness but *the want of power or resolution to examine them, is.*\* Nothing then but an extent of disease which destroys at once all possibility of reasoning, by annihilating, or entirely changing the structure of the organ, can make a man necessarily mad. In all other cases, the being sane or otherwise, notwithstanding considerable disease of brain, depends on the individual himself. He who has given a proper direction to the intellectual force, and thus obtained an early command over the bodily organ by habituating it to processes of calm reasoning, remains sane amid all the vagaries of sense; while he who has been the slave, rather than the master of his animal nature, listens to its dictates without question even when distorted by disease,—and is mad. A fearful result of an uncultivated childhood!

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\* Vide Appendix B.

11. If I am right in what I have advanced, a man may labor under a mental delusion, and yet be a responsible agent: and if sanity or insanity be in a great many instances the consequences of a greater or less resolution in exerting the power of reasoning still possessed, the same kind of motives which influence a man in common life, are still available, though they may require to be somewhat heightened. It is on this principle that the treatment of lunatics has been generally conducted. Fear, one of the lowest, but also one of the most general of instinctive emotions, has been called in to balance the delusions of sense,\* and, excepting in cases where the structural disease is so extensive as to deprive the man of all power of connecting cause and effect, it has been found sufficient to curb violence, and enforce a certain degree of peaceable demeanor towards the attendants. And in this the insane person differs not from the cultivated man who is left at liberty, whose self-control rarely amounts to more than the avoiding actions which would have unpleasant consequences to himself. Suppose an irascible man, incensed by a false report; which, however, he believes to be true; he seeks his supposed enemy, and horsewhips or knocks him down: he does not assassinate, because he fears for his own life if he does; for it is clear that no feeling of duty has held his hand, or he would not have transgressed the laws both of God and man by thus revenging himself.

The madman has the false report from his own senses; wherein do the two differ? Neither has employed means within his power to ascertain the truth, and both are aware that such vengeance is forbidden. I can see no distinction between them,

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\* Vide Appendix C.



save that the delusion of sense has, as a chemist would say, decomposed the character, and shown how much of the individual's previous conduct was rational, and how much the result of mere animal instinct. It would be well for the world if the soi-disant sane were sometimes to ask themselves how far their sanity would bear this test, and endeavor to acquire that rational self-command which nothing but the last extremity of cerebral disease could unseat. We do not descend from our high rank with impunity;—and as, when the matter has become organized, if the process of change, occasioned by the vital force, be impeded or arrested, the plant pines away and perishes:—as, after the organs of locomotion have been superadded, the animal debarred from the use of them, languishes and becomes diseased; so man, if he give not full scope to the intellectual force, becomes subject to evils greater than animals ever know, because his nature is of a higher order.

12. In the classification which I have just given of the various kinds of mental derangement, I have endeavored to make that distinction between structural and functional disease which I consider the first step towards understanding the nature of insanity. Every anatomist knows, that extensive structural disease can exist without producing irrationality. Paralytic patients, though the disease has its origin in the brain, may lose memory, speech, sensation or any other faculty, and yet use the rest calmly and rationally; inflammation may cause pain and irritation, which will produce frenzy without impairing the rational will—for I have known an instance where the patient, feeling that the brain was escaping from her control, gave her hands to be held by the attendants, that she might do no mischief during the parox-

ysm, and then maintained an obstinate silence, that no irrational words might pass her lips. None could doubt that this patient was sane, and exercised a complete self-control in the midst of structural disease.

Neither do severe injuries from external causes, though, like paralysis, they might cause a loss of those faculties which connect man with the world about him, *necessarily* disconnect him with the world within, so as to place him beyond his own command.

A case has been communicated to me illustrative of this. A young lad who had been carefully instructed in the principles of religion and virtue by the clergyman of his parish, afterwards went to sea. When he was about twenty-two he unfortunately fell from the mast upon his head on the deck, and the injury to the brain was such that he was discharged from the service in a state of imbecility, and sent home to his parish. He was then in possession of the use of his limbs and hearing: but articulation was apparently difficult to him, and collected thought, which should enable him to speak connectedly, still more so: his sight, too, was subject to a delusion which made him imagine he saw gold and silver coin strewed about on the ground; which, as was natural, he eagerly endeavored to pick up. He was now visited by the clergyman who had been the instructor of his youth, who in kind terms assured him he was under a false impression, and advised him to give no heed to what he imagined he saw. The poor young man thanked him, and promised to do as he desired, and for a time abstained from attempting to pick up the coin, but gradually the delusion became too strong for his resolution, and he recom-

menced.—Yet after every visit of his former instructor, he again controlled himself for a time: and, if he did not come, anxiously sought him at his own house.—He died in a few months, but during the whole time was mild and submissive, seeming perfectly aware that his mind was disordered; and, like a child who distrusts his own power, seeking to throw himself on the guidance of one whose kindness he remembered, and whose character he respected. This man was suffering mental derangement from injury of the parts, but was not insane: for the faculties left him were rationally exercised.

13. It has already been seen that the delusions of sense may co-exist with perfect sanity: the instances of this, indeed, are so numerous that I should not have time to relate half that I have heard or read of within the last three or four months: but there is another kind of mental derangement, still in a certain degree connected with sense, which is of a more fearful kind, and yet this too is not inconsistent with sanity. A case in point has been given by M. Marc, which has been copied into many works on this subject. The mother of a respectable family, in Germany, on returning home one day, met a servant, against whom she had no cause of complaint, in the greatest agitation.—The servant begged to speak with her mistress alone; threw herself upon her knees, and entreated that she might be sent out of the house. The mistress, astonished at this request, inquired the reason, and learned that whenever the unhappy woman undressed the little child which she nursed, she was struck with the whiteness of its skin, and experienced an almost irresistible desire to tear it to pieces.—She felt afraid that she should not have power to resist this desire, and therefore begged to be allowed to leave the house,

that she might be in no danger of committing so great a crime.\*

Some other cases are also given by M. Esquirol where the desire to commit an atrocious act was accompanied by a full conception of its enormity ; was resisted, and finally overcome.

Cases of this kind have been considered by some as a peculiar type of insanity. By French authors it is entitled *manie sans délire*. Dr. Prichard styles it *instinctive madness*. I am inclined nevertheless to refer such deranged propensities in some instances to a peculiar and morbid state of sensation, and these will come under the head we are now considering, consequently the desire is not irresistible, though strong, for we see that it has been successfully resisted:—in others I should refer it to the second class under the head of "Inefficiency of the intellectual force," and then it depends on the resolution of the person so affected whether the morbid sensation shall be meditated on and indulged, and thus acquire fresh force, or whether by exciting other sensations, it shall be weakened, and by degrees vanquished.†

There is no greater error than to suppose, that thinking about a propensity which ought not to be gratified, will conquer it: on the contrary, every hour of lonely thought gives it fresh force—but let the man plunge into business that must be attended to, or even a lighter occupation, so it be an engrossing one; and do this resolutely, however irksome it may at first appear, and the very repose thus given to the diseased part, if there be disease, by throwing

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\* Esquirol, *Maladies Mentales*, vol. ii. p. 807.

† Vide Appendix, D.

the whole stress on other portions of the brain, will assist in effecting the cure.

The maid-servant who sought to avoid the sight of the child, did wisely : fresh objects of attention would relieve the part subjected to a morbid affection, and in a short time it would recover its tone. If there be no disease, the self-control thus begun will gradually eradicate the depraved inclination. This cure for insanity was known long ago : Celsus recommends committing things to memory ; and every one who has given a rational attention to the subject, has been earnest in recommending application to some study which should occupy the mind without agitating the feelings, as one of the most effectual modes of counteracting morbid impressions. The constant repetition of this recommendation, shows that it must have been sometimes found effectual, and, if so, it can only be on the principle that I have advanced—namely, the existence of a power in man to direct the operation of the brain, unless it be in a state of such complete disorganization as to be incapable of any.

14. Imbecility of intellect, whether congenital or produced by subsequent injury, as in the case of the young seaman I have mentioned, is equally under the rule of the guiding power. I believe no instance has been found of incapacity so complete as to preclude moral government, if due attention be paid. I will take an instance of this from the work of the younger Pinel. A young girl, hydrocephalous from her birth, was received into the hospital of La Salpêtrière, at Paris. She was sixteen years of age, but in a state of most complete brutishness : her look stupid ; her limbs as small as those of a child of six years old. She was as incapable of understanding as of acting. After the lapse of a few months a

nurse, who had taken a liking to her, succeeded in teaching her first to hold the knitting needles, and then to knit; then to articulate a few words and phrases, till, at the end of a year, she could talk readily, and reply rationally to the questions that were asked her, though there was a degree of mental imbecility. A remarkable change, observes M. Pinel, since the time of her admission, when she appeared a mere senseless machine.—Wherever the mind is capable of connecting cause and effect, moral impressions may be made; therefore this unhappy child, with early culture, might have been rendered capable of self-control, and probably of a much greater advance in mental power.

15. I think I have now produced grounds for assuming that there is no one of the morbid affections of the brain and nerves, which I have placed in my first class, which *necessarily* renders the individual an irresponsible agent. There are too many authenticated cases in which a rational self-government has been exercised, even under these afflicting circumstances, to leave any doubt of its *possibility*. How much previous mental culture may be required to make this possible, is another question: it is sufficient for me here to establish this one great principle, that *diseases of the brain and nervous system, however distressing, may and do, where the mind has been duly cultivated, leave the individual capable of knowing right from wrong, and seeking exterior aid to combat the effects of mental derangement consequent on disease*—a derangement of which he is either conscious at the time, or has an anticipatory knowledge of, which enables him rationally to provide against its violence.

The second class of mental derangement will afford a more melancholy contemplation. In the first

we have seen a man's nobler part triumphing over all the ills of the body, and vindicating his claim to an immortal nature. In the second, we shall have to look on his degradation, and to note the consequences of neglected education, of unregulated passions, of vice, of misery, and, alas that it should be so! of mismanagement also!

## II.

16. It will be recollected that when I formerly treated of the functions of the brain, I showed its constitution to be such, that in the mere animal it was little else than the recipient of sensation, by which indeed its hemispheres might be excited to something like contrivance ere the motor nerves received the impulse, but that, until the intelligent will assumed the sway over it, even in man it was merely the tool of the animal instinct:—and I added that, like all other bodily organs, it might, by disuse, become so impaired in its capability as finally to be in the state of a limb never developed by exercise, which the will strives in vain to direct. When a man has reached mature age without making any effort to render the brain subservient to the rational will, the fatigue and even pain consequent on the endeavor to obtain the mastery over it, is such, that few have resolution to undergo it voluntarily. Thus the man subsides more and more into the animal, and is at last guided only by those instinctive emotions which belong to the vital force merely. His passions assume a delirious violence, and he is only distinguished from the brute by the greater skill with which he pursues their gratification. There is no *disease* of brain, but it has been left unexercised

and ungoverned, till it is as unmanageable as a limb that has been treated in the same way. Toes have been used for writing and other arts which are usually performed by fingers; they are *capable* therefore of such use, but those who have constantly worn shoes cannot direct one toe separately from the rest, as they can the fingers. Yet with much trouble this power of directing might be acquired. It is thus that the brain, unaccustomed to direction from the intellectual force, rebels against it, and if this latter fails to assert its sway, it may justly be termed inefficient. In a man thus animalized, the actions differ from those of his more spiritualized fellow men, who happily are more numerous; and when they find no such motive as *they* would consider a sufficient one, for his conduct, they call him mad, by way of accounting for it. He commits a crime, and the plea of insanity is set up as a shelter from punishment. I will give an instance.—It is recorded by the elder Pinel. “An only son, educated by a silly and indulgent mother, was accustomed to give way to all his passions without restraint. As he grew up the violence of his temper became quite uncontrollable, and he was constantly involved in quarrels and law-suits. If an animal offended him, he instantly killed it; yet, when calm, he was quite reasonable, managed his large estate with propriety, and was even known to be beneficent to the poor: but one day, provoked to rage by a woman who abused him, he threw her into a well. On his trial so many witnesses deposed to the violence of his actions, that he was condemned to imprisonment in a mad-house.”\* Yet any choleric man who does in his rage what he is sorry for afterwards, is as much insane as this man

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\* Pinel, *Aliénation mentale*, p. 156.



was: both are under the influence of the vital force. A shock to some nerve of sensation stimulates the sympathetic system: the circulation is hurried, and the blood flowing more rapidly through the brain, gives an unusual activity to the motor nerves—the movements are sudden and violent, the speech hurried, loud, and perhaps incoherent: but the intellectual force knows the source of these symptoms, and can curb them by resolute silence and inaction till the blood again flows at its usual pace: if it does not, the man for the time is in a state of mania, but is not the less responsible for having allowed himself to be so.

17. Let us suppose another case: the thing is so constantly seen, that every one could quote examples of it.—A man unaccustomed to self-control, becomes occupied by one thought:—his ambition has been disappointed perhaps, or a law-suit has plagued him, or he has been much employed in some engrossing pursuit. Unable to regulate his thoughts at will, he finds the one which circumstances have made habitual, recur uncalled for. An effort would dismiss it, for every one who has studied, knows that he has had to dismiss many an intruding thought, and with some effort too, if he wished to make progress in what he has undertaken: but this individual has never been accustomed to make any such effort, and he knows not how to free himself from the subject that thus haunts him. If it be an unpleasant one, he is wearied and worn by it; but every day that it is not driven off, it assumes a greater power, for the part of the brain thus brought into action is now by habit rendered more fit for use than any other:—he has not resolution enough to free himself from his tormentor by a determined application to something else which would require

all his attention : he sits brooding over it, and, when life has thus become irksome, he strives to terminate his discomfort by suicide : yet here is no structural disease ; and if the man could be persuaded to exert himself, he might be sane. I will give an instance. The master of a parish workhouse, about thirty years ago, was subjected frequently to groundless suspicions of peculation. Being naturally a taciturn, low-spirited man, these false accusations, which involved his character, and consequently the maintenance of his family, preyed upon his mind, and a profound melancholy was the result, attended by the usual symptomatic derangement of the digestive functions, and a constant apprehension that he had done something wrong ; he did not know what. No assurance on the part of those who knew and esteemed him had any effect, and finally after some months of melancholy, he attempted to destroy himself. He was then removed to St. Luke's Hospital, whence, after a year had elapsed, he was discharged incurable. He was now placed in a private receptacle of the insane, and here suffered all the misery which at that time pauper lunatics were subjected to. He was visited at this place by a benevolent man, who, seeing his state, immediately ordered him to be removed into the gentlemen's apartments, and paid for his maintenance there. In a few months afterwards, he was visited by the clergyman of his parish, who, on conversing with him, considered him sane. The man begged to be allowed to rejoin his wife and family, and the rector, after many difficulties and some threats to the parish authorities, succeeded in setting him free. The man from that time was able to maintain his family by his trade of shoemaking, for if ever a fit of melancholy came over

him, a threat from his wife that he should be sent back to the madhouse, was sufficient to engage him to make an effort to resume his cheerfulness, and he remained to old age a sane man. Here the insanity had been merely *inefficiency of the intellectual force*. Placed in a situation of comparative ease, his mind had become calm; the wish to return to his wife and family, and the hope of it, kept up by the visits of benevolent friends, did the rest; for, be it observed that during the whole time he never felt himself abandoned.

18. The poor and the uneducated are the classes which most usually suffer from the *inefficiency* of the intellectual force: it is among the higher ranks usually that its *misdirection* is a source of insanity. Among these, more distant objects of pursuit keep the thoughts longer upon the stretch towards one point; the organs of mechanical memory are strengthened, nay, even strained by the habit of learning much by rote, while the constant supply of learning ready-made leaves no necessity for the more laborious processes of reasoning and comparison. Hence we not unfrequently find an elegant scholar, who can readily quote the words and opinions of others, unable himself to carry on a course of close argument, or to *prove* the truth of what he advances. Whoever has moved in society, knows that it is rare to meet with any one who can command his thoughts in conversation sufficiently to reject all that is not relevant to the subject, so as to keep on the chain of reasoning unbroken.

When the mind is thus exercised in remembering the opinions of others, thus unaccustomed accurately to examine its own, what wonder is it if it should become prepossessed with some irrational notion which cannot be removed by reasoning, be-

cause the individual man in his healthiest state had never chosen so to exercise his mind ; or if, when a delusion of sense occurs, he should choose rather to act upon it as truth, than to examine into the grounds he has for believing it to be such. It is a melancholy fact that a great number of mankind are in this state as regards the faculties most requisite to self-control, and depend far more on the accident of good health, than the exertion of their own intellectual power, for their sanity. I have heard of more than one instance of *hard livers*, as they were termed, who probably in consequence of a slight affection of the brain from the unnatural stimulus of wine long kept up, became possessed with an opinion that they were slighted by one or more of their friends ; and, resisting all reasoning on the subject, ended by destroying themselves. Yet, they were rational on other matters of importance, and therefore it is to be concluded, that even on this point they were capable of being rational. Had they chosen to make the exertion recorded of Henri of Bourbon, son of the great king, that at times he imagined himself transformed into a dog, and would then bark violently, the notion seized him whilst in the king's presence, he then felt it needful to control himself, and succeeded, for though he turned to the window and made grimaces as if barking, he made no noise.\* Had the king's eye been upon him, it is probable that he would have avoided the grimaces also.

19. Insanity from *misdirection* of the intellectual force is so various in its forms, that it would be impossible to give instances of all ; but it has one very general character—namely, that at first there are very

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\* Pinel, *Aliénation mentale*, p. 393.

few symptoms, if any, of structural disease. Some derangement of general health may be observed, but even this is not constant, or, at least, not sufficient in many instances to excite attention: it seems therefore not unreasonable to conclude, that the evil originates rather in the misuse than in the impairment of the organ. Thoughts too long and too intensely fixed on one object, weary the part of the brain so employed, and we usually then seek relief by varying our occupation: if this is not done, the weariness may end in disease.

I remember being told by a friend, that having determined to commit to memory a certain number of Greek primitives every day, after persisting some time, he found that though competent to other study, *this* wearied him. Resolved not to be thus mastered, he persevered in spite of weariness, but in a short time delirium came on. He took the hint, laid aside the Greek primitives, and recovered himself very quickly. Here the misuse of the organ had produced temporary disease; had the subject been one not so easy to lay aside, the temporary disease might have become permanent; especially if the engrossing thought were one originating in instinctive emotion which always influences the circulation largely, and thus is likely to induce an unnatural rush of blood through the brain.

“The indulgence of violent emotions,” observes Dr. Conolly, “is singularly detrimental to the human understanding—and it is to be presumed, that the unmeasured emotions of insanity are sometimes perpetuated in consequence of the disorder of brain originally induced by their violence. A man is at first only irritable, but gives way to his irritability. Whatever temporarily interferes with any bodily or mental function, reproduces the disposition to be

irritated, and circumstances are never wanting to act upon this disposition till it becomes a disease. The state of the brain or part of the brain, which is produced whenever the feeling of irritation is renewed, is more easily induced at each renewal, and concurs with the moral habit to bring on the paroxysm on every slight occasion—other vehement emotions and passions effect the same disorders of the mind.”

Time will not allow me to do more than quote the conclusions drawn by this very able writer from his preceding observations. “Seeing that any feeling in excess may become independent of the restraint of the comparing powers, and thus impair or disorder the understanding, we cannot but remark the importance of cherishing that governing and protecting action of the mind by careful cultivation and exercise. Whoever will converse with lunatics, will soon be satisfied that a very small portion of them consists of persons whose talents have been regularly and judiciously cultivated”\*—for “most exercise the faculties of their mind liable to insanity, and nothing is rarer than the mad mathematician; for, as no study demands more attention than mathematics, so it secures him during a great part of his time, from the influence of feelings which are always the most violent in those who are the least occupied.”†

20. The diseases which come under the last division of my classification are the most discouraging, for here either the organs requisite to correct perception are wanting, or there is adhesion or other disease which impede their action. Yet even among

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\* Conolly's Inquiry concerning the Medications of Insanity, p. 102.

† Ibid. p. 347.

those apparently hopeless cases, we find such unequivocal symptoms of a struggle between the intellectual force and the defective organs, that it becomes *probable* at least, that this very struggle may be made to operate beneficially on the diseased parts, as we find a palsied limb benefited by the attempt to use it. M. Esquirol, in his work "*les Maladies mentales*," observes, that among his idiotic patients at Charenton, he had generally found a physical difficulty in fixing the attention even where there was a wish to do so. In other words, the organs did not respond to the will which endeavored to direct them. He mentions that he had wished to have plaster casts of the heads of many of his patients, and that with the maniacs he had succeeded. Even the most furious had consented to keep quiet long enough for this purpose:—a strong proof, by the by, of the immense power of the intellectual will, even in such cases, if a motive can be found strong enough to induce its exertion—but the idiots could never keep their eyes shut, and themselves quiet, long enough to complete the operation, though they were anxious to do so. "I have seen some," says he, "who wept because the casts had not succeeded, and undertook afresh, and for several successive times to remain quiet, but always in vain."\* I have myself heard of an instance of a girl of weak intellect who wept bitterly because she could not learn as others did. There can hardly be a doubt, that in these cases moral training, which happily requires no great effort of memory or stretch of thought, might be perfectly practicable. The strong will is there; imprisoned indeed, with scarcely a

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\* Esquirol, *Maladies Mentales*, vol. i. p. 21. Vide Appendix E.

glimmering of light from this lower world, but it is still potent, and I have had more than one case communicated to me, where, though the individual possessed not enough of intellect to be entrusted with the management of the most trifling affairs, his moral sense seemed unimpaired, and his conduct was exemplary. In one instance, the father was a blacksmith; and the imbecile son had been taught to strike with the great hammer, which he did perseveringly when told to do so, and thus earned a subsistence, though his limbs had the usual shambling movement of idiots, and though he was scarcely able to express his meaning by words. On one occasion he accidentally killed a neighbor's goose by throwing a stone—he was inconsolable, and could only be pacified by the fullest restitution to the owner. In this case, the intellectual force had been wisely employed to counteract the natural defect, for the man became more and more capable as years passed on; and finally having earned enough to supply his frugal subsistence and allow of saving besides, he spent the last years of his life in repose—a respected member of society—for though his mental deficiency was known, he was honored for the worthy use he made of the little capacity he possessed. Such probably might have been the happier history of many an unfortunate being now abandoned to a state of brutalism, if those about him had done their duty towards him in early life.

### III.

21. Of course in the investigation of a subject which might occupy a year more fitly than an hour, I have had to select my information, and compress



it into the smallest possible space: yet I cannot but flatter myself that I have given enough to bear out my opinion, that man has in the resources of his own nature the antagonist power which, if properly used, can set at naught the evils, ay, and the so called irresistible propensities too, of the bodily organism. So nicely balanced indeed is the machine, that a grain can turn it to either side, but it is in the power of the will to cast that grain. Cast on the side of instinct, the propensity becomes passion, and the passion crime, and both are for the time insanity:—For when once the intelligent will has lent its force to the blind impulses of the body, whether diseased or in health, it becomes only a question of time whether the individual is to be called insane and placed under restraint or not.—The man who recovers quickly from his madness is called a sane man, though during the few preceding minutes or hours he may have exhibited the flushed face, the rapid and violent language and gestures, and the unreasoning conclusions of a maniac: but strange to say, if this be very frequent, he is excused and considered innocent of the crimes he perpetrates, exactly because he has committed the greatest of all crimes by delivering over his godlike intellect to be the sport of that brute nature which it ought to regulate. There can hardly be a stronger proof of the necessity of some such classification of mental derangement as I have proposed.

22. It is observed by those professionally conversant with the subject, that up to fifteen years of age cases of insanity are very rare:—after that period, and during the period of maturity, they are frequent—so frequent, that statistical reports give a proportion of one in between six and seven hundred of the whole population of England of persons so affected.

As far as regards age, the statistics of crime give us nearly the same results as those of insanity.—I have been informed by two gentlemen who had large opportunities of observation, one in a manufacturing, the other in an agricultural district, that sixty per cent of the offences attended with violence which have come under their notice, have been committed by persons between fifteen and thirty—to which we may add that crime and insanity generally keep pace. During the French Revolution of 1793, when men were let loose to commit all sorts of violence, insanity increased to a frightful extent: with the restoration of order, it again decreased; and in England I believe it will be found that in proportion as criminals have become more numerous, the registers of lunatic asylums show that the numbers of their inmates have also increased. Something must be allowed for the larger population: but even where that is allowed for, I am afraid we shall find that both are growing evils.

23. Even had we paid no attention to the symptoms and the state of the mentally deranged, this parallelism would give some cause for inquiry whether the two might not be in some way connected: and if, as I have inferred from a close examination of cases, violent and unreasonable insanity is most frequently the result of either a frivolous and ill-governed mind, or of loose moral principles; for excesses of all kinds affect the brain fearfully\*—then the connection between the two becomes sufficiently apparent, and the remedy for both would be a sound and moral education. A brain strengthened by rational exercise, *not* merely by committing words to memory, but by applying the

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Vide Appendix F.

power of thought to whatever subject is presented, and neither exhausted nor loaded by irregularities of life, is but little likely to be attacked by disease: but if it be, mental derangement may occur, but not mischievous insanity: and thus the larger half of the evil is removed.

24. But how has the danger of such a calamity, frightful as it is, been met by poor and rich?—A country with an extensive frontier exposed to invasion from powerful enemies, if its governors be wise, erects fortifications, forms strong alliances, and disciplines its inhabitants in the use of arms. Every child is in the situation of such a country,—but are its governors wise? Where are its fortifications of mental occupation—its alliance with a better world—its discipline of self control?—The reports of commissioners lately made public, have given a fearful answer to the question as regards the poor.—Are the rich better cared for? What advantage does the child receive from its educated parents? Its clothing is finer, its food more delicate; but during those six precious years when the brain is acquiring the bent which may form the character through life, it is consigned to the nursery: to the companionship of uneducated and misjudging, perhaps vicious, at any rate, uninterested persons: shut out, even more than the children of the poor, from the experience of life, with no conversation to stimulate the young brain to further development, no principles instilled, no curiosity gratified. A dull routine of lessons is perhaps carried on, taxing the tender organ beyond its powers—thus inducing instead of preventing disease, while the inquisitiveness, which seems the very instinct of childhood, and the attempt to reason on what is propounded, are sternly repressed: obedience, not *self*-management is enforced: and the child grows up,

notwithstanding the *show* of learning or accomplishment, with an unregulated mind, ignorant of man's best knowledge, motiveless, and dependent on circumstances. The boy is then to be sent forth into a world full of difficulties, to sink or swim: to make a character for himself if he can:—As well might troops begin to make their muskets when the enemy is in sight.

25. But if this be the case as regards the male sex, how much more fearfully then is it of the female! Here the Drawing-room but perpetuates the inertness of the Nursery,—and woman, so largely endowed by nature, is degraded by social prejudice, and the frivolous education consequent upon it, till she is left at the mercy of events, the creature of impulse and of instinct. Yet physiologists have demonstrated that the organs of thought are proportionably larger in woman than in man:\* and many a bright example has shown how well they *can* be employed. One plain statistical fact shows that no terms that I can use in the reprobation of this cruel system can be too strong. The registers of Lunatic Asylums show the number of female patients to exceed that of males by nearly one third.†—We have the assurance of professional men well experienced in the treatment of the insane, that nothing is more rare than to find among them a person of a judiciously cultivated mind; and yet, with this fact staring us in the face, we systematically consign the mothers of the rising generation to a species of

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\* Vide Appendix G.

† Webster's *Observations on the Admission of Medical Pupils to the Wards of Bethlem Hospital*, p. 52. Though the observation is there made on the registers of the Hospitals and Asylums for Lunatics in France, it holds good equally with respect to England.

training which leaves them and their families a prey to one of the worst ills that flesh is heir to. We need not ask what woman's destination is—nature has written it in characters too clear to be mistaken: the large development of the intellectual organs, and the feeble muscular power, mark her for the high-minded purifier of society—her strength must be that of knowledge:—yet we refuse the kind of culture which such an organization requires, hide the victim of mis-management in a madhouse—and then talk proudly about an enlightened age!

26. Should my position, that the difference between sanity and insanity consists in the degree of self-control exercised, appear paradoxical to any one, let him note for a short time the thoughts that pass through his mind, and the feelings that agitate him: and he will find that, were they all expressed and indulged, they would be as wild, and perhaps as frightful in their consequences as those of any madman. But the man of strong mind represses them, and seeks fresh impressions from without if he finds that aid needful: the man of weak mind yields to them, and then he is insane.

That this is the true view of the case, may be proved from the innumerable cases where insanity has been cured, not by any medical treatment, but by fear of what was unpleasant; or some deep impression which sufficed to counteract the former one. Dr. Conolly mentions that in the Glasgow Lunatic Asylum, a patient afflicted with religious melancholy had made up his mind to destroy himself, but that a short passage from the Scriptures, impressively and kindly spoken to him, not only prevented the commission of suicide at the time, but had the effect of permanently checking the tendency to it. The same dreadful thoughts frequently re-

turned to the patient's mind, but the recollection that "no murderer hath eternal life" returned also, and the crime was refrained from.\*—This man then had the power to restrain himself: yet had those words never been spoken, and had he committed suicide, he would have been held insane and incapable of doing otherwise.—I must not multiply examples, though it would be very possible, but will merely quote the words of a Physician in extensive practice, lately addressed to myself.—"I completely coincide with you in opinion," says he, "as to the power of the will in suppressing the manifestation of insanity—a fact sufficiently illustrated by the dexterity with which the insane contrive to conceal their delusions; of which I, in common with others, have seen many examples. I have often observed with astonishment that when patients are put upon their guard, or have any purpose to achieve, they will keep their hallucination out of sight in a most surprising manner. What is now fashionably termed *monomania*, is more often owing to a want of moral control over the mind than to any unsoundness of the intellectual faculties: so that in fact it ought to be viewed as moral depravity rather than mental disorder." This is strikingly exemplified in a case recorded by M. Georget, of a young man seventeen years of age, who after committing all sorts of outrages, finished by murdering his father. On seeing the dead body of his parent a short time after, he addressed it with—"Ah, my dear father, where are you now?"—and after some other remarks he concluded—"It is you and my mother who have caused this misfortune—I

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\* Conolly's Inquiry, &c., p. 25.

foretold it you a long time ago:—but if you had brought me up better, it would not have been thus.”\*

I may add in corroboration of the opinion here expressed, that instances are by no means rare, when the post-mortem examination in cases of decided and violent insanity, has exhibited no apparent sign of disease in the brain; a circumstance which of course would lead to a suspicion that the morbid affection was rather functional than structural. It has been observed to me by a distinguished friend, who formerly filled the office of Secretary of State in the Home Department, that the increase of crime has generally been in the ratio of the want of employment for the people; and that it is probable that the same cause may operate towards increasing insanity. A mind kept on the stretch with thinking how the next meal may be provided, or sunk in the apathy which, among uncultivated people, the lack of any call upon the attention is apt to produce, may well operate in diseasing an organ which will neither bear too much exercise nor too little.

27. The result then of the whole inquiry appears to be, that man being a compound of two natures, mental derangement is of two kinds. In the one kind, structural disease deadens or distorts the perceptions, and if this extends itself to the organs of all the faculties, the intellectual force having no longer the means of external action, the individual remains to all appearance a helpless machine. But, as such extensive structural disease is hardly compatible with life, so it is of very rare occurrence, and, if any part of the organ remain perfect, then there is good reason to hope, that a mind thoroughly well-trained in early years, will still contrive to make the

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\* Georget, *Discussion Médico-légale sur la Folie*, p. 144.

little that is left available to conduct, if not to the higher intellectual functions: as we see the loss of the right hand replaced in some degree by the increased activity of the left.—But in the other case, no structural disease exists in the first instance, and the inefficiency or misdirection of the intellectual force is the sole cause of derangement: sometimes by the violence of the excitement producing disease, sometimes, as I have already noticed, continuing to the last without affecting the bodily organs.

28. The cases of insanity, we are told, have nearly tripled within the last twenty years!—a fearful increase even after allowing to the utmost for a larger population!—of these cases it is calculated that less than three hundred\* in one thousand are the result of disease, or of unavoidable circumstances, thus leaving above seven hundred resulting from bodily excess or mental misgovernment.—On the heads then, of legislators, of teachers, and of parents, lies the heavy charge of having in all these instances left those godlike faculties uncultivated, which, if duly used, might make earth the ante-room of heaven and man the fit Vicegerent of the Deity in this fair world. What man *is* generally, and what the world is in consequence, I need not detail.—We all know and feel it. Would to heaven we all knew what man *can* be, and had felt what the world might be were he such!

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\* Vide Appendix H.





## APPENDIX.

### A.

“A STRIKING instance is on record, which does not on first sight seem to admit of explanation. It is that of Nicholia, of Berlin, related by himself to the Royal Society of that city in 1799. He was a man of much imagination and great industry; during the year 1790, he had been subjected to causes of great anxiety and sorrow; and it would seem that he had that year also neglected to lose blood by venesection or leeches so frequently as for some years, in consequence of vertigo and other complaints resulting from studious and sedentary habits of life, he had been accustomed to do. Early in February, several incidents of a disagreeable nature occurred to him; and on the 24th of that month he relates:— ‘At ten o’clock in the forenoon my wife and another person came to console me: I was in a great perturbation of mind, owing to a series of incidents which had altogether wounded my moral feelings, and from which I saw no possibility of relief; when suddenly I observed at the distance of ten paces from me a figure, the figure of a deceased person. I pointed at it, and asked my wife whether she did not see it. She saw nothing, but being much alarmed, endeavored to compose me and sent for a physician. The figure remained some seven or eight minutes, and at length I became a little more calm.’— ‘In the afternoon a little after four o’clock, the figure, which

I had seen in the morning, again appeared. I was alone when this happened; a circumstance, which, as may easily be conceived, could not be very agreeable. I went, therefore, to the apartment of my wife, to whom I related it. But thither also the figure pursued me. Sometimes it was present, sometimes it was absent, but it was always the same standing figure.' 'After I had recovered from my first impression of terror, I never felt myself particularly agitated by these apparitions, as I considered them to be, what they really were, the extraordinary consequences of indisposition: on the contrary I endeavored as much as possible to preserve my composure of mind, that I might remain distinctly conscious of what passed within me. I observed those phantoms with great accuracy, and very often reflected on my previous thoughts, with a view to discover some law in the association of ideas, by which exactly these or other figures might present themselves to the imagination.' 'The figure of the deceased person never appeared to me after the first dreadful day, but several other figures showed themselves afterwards, very distinctly; sometimes such as I knew, mostly, however, of persons I did not know; and amongst those known to me were the semblances of both living and deceased persons, but mostly the former: and I made the observation that acquaintance with whom I daily conversed, never appeared to me as phantasms: it was always such as were at a distance. When these apparitions had continued for some weeks, and I could regard them with the greatest composure, I afterwards endeavored at my own pleasure to call forth phantoms of several acquaintance, whom I for that reason represented to my imagination in the most lively manner, but in vain.'— 'The phantasms appeared to me in many cases in-

voluntarily, as if they had been presented externally like the phenomena of nature, though they certainly had their origin internally; and at the same time I was always able to distinguish, with the greatest precision, phantasms from phenomena. Indeed I never once erred in this, as I was in general perfectly calm and self-collected on the occasion. I knew extremely well when it only appeared to me that the door was opened, and a phantom entered, and when the door really was opened, and any person came in.' These figures appeared to Nicholai when alone or when in company, or even in the street, and continued to haunt him for about two months:—at last they disappeared; sometimes returning for a time, and lastly during the time in which he was writing an account of them. (Nicholson's *Journal of Natural Philosophy, Chemistry, and the Arts*, vol. vi. p. 161.) A correspondent in the *Journal* from which I have quoted the case of Nicholai, describes himself as having been the subject of such hallucinations during an attack of fever: he saw innumerable faces all very agreeable—but fancying that these appearances indicated a breaking up of the system, and that the confusion of his senses was but the precursor of his speedy destruction, the spectra assumed a character associated with this uncheering belief; and instead of the very prepossessing faces which had before visited him, he beheld a visage of an enraged expression, which seemed to belong to a figure which pointed again at him. The patient began to perceive the influence which his thoughts had upon his waking visions and voluntarily directed them towards architectural recollections and natural scenery; and, after some time, a corresponding change came over the appearances which were presented to him.—He then turned his thoughts towards music, and dreamed dur-

ing a short sleep that a cat leaped upon his back, and awoke him with shrill and piercing screams. The sleeping and the waking dreams were thus plainly enough proved to be formed very much in the same manner.

“A distinguished physiological writer of our own country has related something similar which occurred in his own person. ‘I was laboring,’ he says, ‘under a fever, attended with symptoms of general debility, especially of the nervous system, and with a severe pain of the head, which was confined to a small spot situated above the right temple. After having passed a sleepless night, and being reduced to a state of considerable exhaustion, I first perceived figures presenting themselves before me, which I immediately recognized as similar to those described by Nicholai, and upon which, as I was free from delirium, and as they were visible for three days and nights with little intermission, I was able to make my observations. There were two circumstances which appeared to me very remarkable; first, that the spectral appearances always followed the motion of the eyes; and secondly, that the objects which were the best defined, and remained the longest visible, were such as I had no recollection of ever having previously seen. For about twenty-four hours, I had constantly before me a human figure, the features and dress of which were as distinctly visible as that of any real existence, and of which after an interval of many years, I still retain the most lively impression: yet neither at the time nor since, have I been able to discover any person whom I had previously seen who resembled it. During one part of this disease, after the disappearance of the stationary phantom, I had a very singular and amusing imagery presented to

me. It appeared as if a number of objects, principally human faces or figures, on a small scale, were placed before me, and gradually removed, like a succession of medallions. They were all of the same size, and appeared to be all situated at the same distance from the face."—(Dr. Bostock's System of Physiology, vol. iii. p. 204.) *Conolly's Inquiry concerning the Indications of Insanity*, p. 105. *et seq.*

## B.

"I used frequently to see a poor maniacal creature, in whose malady there were many intervals of sanity; and during these intervals she would grievously complain of the annoyance she experienced from simultaneous illusions of sight, smell, hearing, and general sensation; all kinds of animals seemed to be scampering before her; the smell of brimstone, and the continual sound of singing voices conspired to trouble her, and with all this her expression used to be that she felt "*still*, and as if she could die at any moment," yet she was at such times quite conscious that her sensations were diseased, and was of sane mind: she could exercise her observation on others, and by comparison of their unconcern with the false images which her senses figured to be around them, remain convinced that the images were unreal. It may be remarked by way of example, that in a fever the patient's bed will seem in flames: or voices will whisper in his ear, &c. If we talk with patients thus affected, some will tell us, in a very quiet way, that they are thus tormented; others will seem confused, and make a visible effort of sight and hearing before they tell us how they are troubled; and others

will tell us what they see, and what they hear, with an expressed belief, on their part, of the reality of what we know to be delusion. Of these three classes of patients, the last are in a state of delirium, the second are approaching to it, the first are in a state of sound mind." *Conolly's Inquiry, &c.* p. 115.

## C.

A curious instance of the effect of fear in the control and final cure of insanity, will be found in the treatise on *aliénation mentale* in the Dictionnaire de Médecine et de Chirurgie pratiques, p. 576. I quote the words of the author M. Foville, "J'ai vu les préparatifs de cette application (cautère actuel à la nuque) causer une frayeur extrême à une jeune maniaque qui jusque là n'avait pas eu un instant de connaissance. Lorsqu'elle se sentit touchée par le fer rouge, elle fit de tels efforts pour se soustraire à son action qu'elle échappa aux mains de plusieurs personnes employées à la contenir. Pendant cinq minutes, elle jouit de toute sa raison, demanda ce qu'on voulait d'elle, pria avec instance qu'on l'épargnât. M. Esquinol lui dit qu'il consentait à différer l'application du cautère actuel à condition qu'elle se conduirait raisonnablement, qu'elle se mettrait au travail. Elle le promit, et tint parole; elle fut immédiatement transférée dans la division des convalescentes, où la guérison devint parfaite en peu de temps." He adds "Elle avoua, quand elle fut guérie, que la frayeur causée par le fer rouge avait plus que toute autre chose contribué à remener sa raison." The author of this treatise adds farther that the actual cautery had no beneficial effect in any cases where the pain was not felt; so that it is evident that, in the cases where it succeeded, the

success was owing to the stimulus it gave to the will of the patient, who, till then, had been too indolent to exert its full power over the brain. Another case is given by M. Pinel to exemplify the use of the Douche, not only as a punishment, but also as a means of suddenly diverting the thoughts of the patient from the subject which is engrossing them. A woman of strong constitution who had been mad at intervals for ten years, was most violent; struck every one around her, tore in pieces her clothes, bed clothes, &c., and was perfectly unmanageable. On her admission into the Salpêtrière, as soon as she began tearing every thing around her, a strong douche was applied, and she was fastened down in her bed by a straight waistcoat. As soon as she entreated for pardon she was released; and on a relapse the same means immediately re-adopted. She became better, but the physician, under whose superintendence alone these measures were allowed to be used, fell ill during twelve days. The patient, relieved from all fear of punishment, fell into her old ways, and was as bad as ever. The doctor then took his place again, and threatened to punish her, of which she took no heed. She was conducted to the bath, and had a strong douche of cold water, during which the doctor spoke to her strongly, but without anger, and told her she would be still more severely treated. She shed a torrent of tears, became quite calm, and was soon after cured.

These persons so capable of exerting mental self-control, when thus urged to it by fear, needed not to have been mad at all; the same resolution that at last *cured*, would have *prevented* madness, had it been exerted.



## D.

I shall here give a case which M. Georget has recorded in his "*Discussion médico-légale sur la folie*," on the authority of M. Marc. From this case, and others of the same kind, he infers that there is a degree of mental disease; qui ôte à l'homme sa liberté et le porte à commettre des actes répréhensibles . . . il existe une monomanie homicide," and I give it for the sake of showing the fallacy of the reasoning by which he arrives at that conclusion. In this case (*Discussion, &c.*, p. 39), a woman, aged about thirty, cut off the head of a child four years old, the daughter of a poor man, who was driving her and this child in a cart. She had the day before prevailed on the man to give the child the drive, and she got him out of the way on some pretence while she perpetrated the crime.

It appeared on inquiry that there was a litigation pending between this woman and a serjeant's wife; that the latter had obtained a warrant against her; that, flying from the officers of justice, she took refuge with a person with whom she was slightly acquainted, and whose hospitality she obtained on this occasion on some false pretence; that, while she was considering in what direction she should proceed, being determined not to return home, the idea of murdering the children of her entertainer occurred to her; from this plan she was, however, diverted by the thought of the ingratitude of such a proceeding. She then resolved on selecting some other child for the same purpose, when this peasant offered her a seat in his cart to the village. She found out that he had an only daughter, whom she resolved on assassinating on the following strange reasoning. "L'enfant du

paysan est fille unique; moi aussi je suis fille unique, et j'ai toujours été très malheureuse. Un semblable sort est peut-être réservé à cet enfant; en conséquence, il vaut autant que ce soit lui que je tue qu'un autre." For this purpose she stole a knife from her host, and sharpened it carefully that her victim might suffer the least possible pain. There was evidence that she had previously been deranged, and she was acquitted on the score of insanity.

Now it is observable, in this case, that so far from being under an irresistible influence, this woman could control herself. She felt the moral turpitude of killing the children of her benefactor, and she abstained from the act:—she was, therefore, capable of resisting the impulse if she chose to exert a small share of resolution. The primary cause of the disposition to murder may probably be found in that peculiar state of the nervous system described by Dr. Conolly. "In any general excitement of the nervous system," he observes, "it is not uncommon to find irritation referred to the extremities of nervous ramifications. The susceptible child, when interested with its book, bites the ends of its fingers; the nervous man in a state of anxiety or emotion does the same. The approach of maniacal disorder is sometimes indicated by a disposition to bite, cut, and tear the fingers. The injuries and wounds inflicted on themselves by lunatics are often to be similarly accounted for."—(Conolly's Inquiry, &c. p. 98.) Instead, therefore, of the "*monomanie homicide*" of M. Georget, which "*ôte à l'homme sa liberté,*"—it would appear simply that excitement of the brain produces an extraordinary irritation of the nerves, which leads to cutting or tearing whatever comes in the way of the person so excited; but that nevertheless this disposition is under the control of the

will; and the patient might generally, if previously well disposed, claim exterior aid to control this irritation, if he found it growing too strong for self-government.

## E.

It is observed by Professor Tiedemann, that "the brain of men endowed with but feeble intellectual powers is often very small; particularly in congenital idiotismus. The brain of an idiot fifty years old, weighed but 1lb. 8oz. 4dr., and that of another, forty years of age, weighed but 1lb. 11oz. 4dr. The brain of a girl, an idiot, sixteen years old, weighed only 1lb. 6oz. 1dr.\* The brain of men who have distinguished themselves by their great talents, on the contrary, is often very large. The brain of the celebrated Cuvier weighed 4lbs. 11oz. 4dr. 30grs.†" As in the above cases of idiocy, the weight of brain scarcely exceeds that of a new-born child, it is to be presumed that by some means it has been arrested in its growth.

## F.

M. FOVILLE, in his *Anatomie Pathologique*, in noticing the "*altérations chroniques de la substance corticale*," gives a case which I shall again quote in his own words: "J'ai observé cette altération au plus haut degré d'intensité chez un jeune homme d'une *constitution détériorée par des excès de tout*

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\* Troy or Apothecaries' weight.

† Phil. Trans. 1836, part 2. p. 502.

*genre* ; une émotion vive détermina chez lui l'explosion d'une aliénation mentale compliquée de son début, de paralysie générale ; quelques semaines suffirent pour porter au plus haut point la dégradation morale et physique. Dans les derniers temps de la vie la maigreur, déjà très prononcée, fit de nouveaux progrès si rapides, qu'en trois jours les globes oculaires étaient véritablement retirés au fond des orbites, tandis que les paupières étaient restées tendues demi ouvertes, quelques lignes au devant des yeux. La substance corticale des convolutions très brune, très humide, d'une mollesse diffuente cédait au plus léger contact. La perte de substance, les inégalités produites par l'apposition des doigts ou d'un linge disparaissaient en un instant comme cela aurait lieu à la surface d'un corps qui entrerait en fusion. D'ailleurs chez ce malade la substance blanche était elle-même profondément altérée d'une manière analogue à la grise."

Another analogous case is given in the Répertoire de M. Baillarger, where a "garçon marchand de vin," aged thirty, was received into an hospital for lunatics, May 23, 1827, after having led a life of great excess and profligacy, to which the state he was then in was attributed. "La mémoire et le jugement étaient fort affaiblis. Il avait de la difficulté à parler, beaucoup de lenteur et de roideur dans la marche, mais pas précisément de délire maniaque ni d'incohérence dans les idées." He was in the Bicêtre six or eight months ; the paralysis and the difficulty of walking increased, he was attacked with scurvy, and died in January. *Post-mortem examination*—"Le feuillet cérébrale de l'arachnoïde et la pie-mère réunis sont d'un mineure extrême. Ces deux feuillets ne sont ni injectés, ni adhérents à la surface du cerveau, les deux substances du cerveau,

du cervelet, et des moelles, sont fermes, mais pâles et décolorées et ne contiennent pas de sang. La teinte de la substance corticale est d'un gris légèrement jaunâtre. Les deux feuillets de l'arachnoïde rachidienne sont unis dans toute leur étendue par de très petites adhérences extrêmement minces et transparentes. Il y a une grande quantité de sang infiltré dans le tissu cellulaire du canal rachidien."—*Annales médico-psychologiques, Janvier, 1843. Répertoire*, pp. 180, 181.

Would space permit, instances of this kind might be lamentably multiplied.

## G.

Professor Tiedemann, in an elaborate paper published in the *Phil. Trans.*, for 1836, part 2, on the brain of the negro, takes occasion to notice the comparative weight and size of the brain in Europeans, both males and females. The parallelism is incomplete; I can therefore only cite a few examples from the table given by him. The weight indicated is Troy or Apothecaries' weight.

| Sex.   | Age.     | Weight of Body. |     |     |     | Weight of Brain. |     |     |     | Weight of Brain as compared with that of the Body. |
|--------|----------|-----------------|-----|-----|-----|------------------|-----|-----|-----|----------------------------------------------------|
|        |          | lb.             | oz. | dr. | gr. | lb.              | oz. | dr. | gr. |                                                    |
| Male   | New-born | 7               | 3   | 2   | 8   | 1                | 1   | 1   | 10  | as 1 : 6.63                                        |
| Female | Ditto    | 7               | 2   | 0   | 0   | 1                | 0   | 4   | 40  | 1 : 6.83                                           |
| Male   | Fifteen  | 100             | 7   | 0   | 3   | 4                | 6   | 0   | 0   | 1 : 24.70                                          |
| Female | Thirteen | 63              | 2   | 6   | 23  | 3                | 6   | 2   | 30  | 1 : 17.93                                          |
| Ditto  | Sixteen  |                 |     |     |     | 3                | 10  | 2   | 0   |                                                    |
| Male   | Thirty   |                 |     |     |     | 3                | 11  | 7   | 0   |                                                    |
| Female | Ditto    |                 |     |     |     | 3                | 11  | 0   | 0   |                                                    |
| Ditto  | Ditto    | 123             | 4   | 2   | 25  | 3                | 7   | 0   | 0   | 1 : 34.42                                          |

|        |           |     |    |   |    |   |    |   |    |   |   |       |
|--------|-----------|-----|----|---|----|---|----|---|----|---|---|-------|
| Male   | Fifty     | 132 | 8  | 4 | 35 | 3 | 10 | 7 | 5  | 1 | : | 33-96 |
| Ditto  | Ditto     | 181 | 8  | 2 | 0  | 4 | 1  | 0 | 10 | 1 | : | 44-47 |
| Ditto  | Ditto     | 141 | 1  | 0 | 0  | 3 | 8  | 1 | 40 | 1 | : | 37-76 |
| Female | Ditto     | 134 | 6  | 2 | 57 | 3 | 4  | 0 | 40 | 1 | : | 40-27 |
| Ditto  | Sixty     | 135 | 11 | 0 | 0  | 3 | 5  | 5 | 0  | 1 | : | 39-18 |
| Male   | Sixty-one |     |    |   |    | 3 | 7  | 4 | 0  |   |   |       |

Here it will be seen that the female brain is frequently, relatively to the size of the body, somewhat larger than the male, and the Professor observes hereupon, "Although Aristotle has remarked that the female brain is absolutely smaller than the male; it is nevertheless not relatively smaller, compared with the body; for the female body is in general lighter than that of the male. The female brain is for the most part even larger than the male, compared with the size of the body."

Dr. Fletcher, in his Rudiments of Physiology, observes that "the size of their brain as compared with their spinal marrow is somewhat greater in females than in males. Hence we might be led to conclude that in reality it is not their faculty of thinking, but their materials for thought, which are less than in males." Whether therefore we consider the size of the brain relatively to the size of the body or relatively to the size of the nerves, which go to make up the spinal marrow, we find the female brain has very commonly a trifling advantage over that of the male. It was indeed to be expected that the inferior muscular power should have a compensation; as we find that in animals deficient in strength, superior skill in contrivance is usually given as a defence.

## H.

In one thousand male patients the causes of insanity have been referred as follows :

|                           |     |                            |     |
|---------------------------|-----|----------------------------|-----|
| Epilepsy - - - - -        | 78  | Misfortunes - - - - -      | 69  |
| Born Idiots - - - - -     | 71  | Chagrin - - - - -          | 54  |
| Old Age - - - - -         | 69  | Love - - - - -             | 47  |
| Accidents - - - - -       | 39  | Religious enthusiasm - - - | 29  |
| Poisonous effluvia - - -  | 17  | Political events - - - - - | 26  |
| Malformation - - - - -    | 4   | Ill-usage - - - - -        | 12  |
| Drunkenness - - - - -     | 110 | Crimes, remorse, and de-   |     |
| Consequences of disease - | 100 | spair - - - - -            | 9   |
| Ambition - - - - -        | 73  | Pretended insanity - - - - | 5   |
| Excessive labor - - - - - | 73  | Other and unknown causes   | 115 |

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It may be as well here to add, lest any misunderstanding should arise, that the author, in giving his classification of insanity, has only endeavored to sketch a broad outline, leaving the shades of difference, and the details generally, to be filled up by those whose professional experience enables them to do so with greater precision.—Every one who has attempted to classify any subject knows how one division blends into another, and how often even a plant is with difficulty adjusted into its proper place.—Much more must disease become complicated in its details, where two dissimilar forces are in action together, at once influencing and disturbing each other.

THE END.

**SMALL BOOKS ON GREAT SUBJECTS.**

**EDITED BY A**

**FEW WELL-WISHERS TO KNOWLEDGE.**

**No. IV.**





AN  
INTRODUCTION  
TO  
PRACTICAL ORGANIC CHEMISTRY.

WITH REFERENCES TO THE

WORKS OF DAVY, BRANDE, LIEBIG, ETC.

by  
*Caroline Frances Coleman*

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## PRACTICAL ORGANIC CHEMISTRY.

IN former times when science, like coaches, traveled at a leisurely pace, it was not difficult to keep up with it, or, at least, to be left at no very great distance behind: its practical results were taught by fathers to their sons, and a new edition of an encyclopædia published once in about fifty years, sufficed for all common demands. But this century has altered the face of things: the science learned in our childhood avails not for our manhood: fresh discoveries and fresh practical applications of them occur every day, and every year wants its new encyclopedia. The consequence of this is, that seeing science flying onward at railroad speed, men despair of even keeping it in sight, and renounce the chase as hopeless; and thus there is danger that the mass of mankind may become more ignorant, in proportion as the few grow wiser.

But however impossible it may be for those involved in the daily business of their respective callings, to follow up the smaller details of natural science, there are always a few great principles from which all the rest must spring; and the very nature of truth is, that it is simple and easy of comprehension. To acquire these, therefore, requires no long time or great stretch of application; yet these being once fixed in the mind, the foundation is laid, and we can build as much upon it afterwards as we please.

It is the object of the present little work to give a few of the great principles which a very interesting portion of modern science is grounded upon; and

by omitting technical details, to make it available to the unscientific reader. There is much in Prof. Liebig's views of organic chemistry which may enable the gardener and the farmer to work on a more rational plan; much which may tend to the preservation of health by showing the relation of diet and air to the well-being of the body, and in consequence to that of the mind; for, as was well observed by an excellent man now deceased, "If the body have not a due share of attention, it will make the soul pay dear for its lodging."—In this little treatise, therefore, as much as may serve these purposes is brought forward in as simple a form as the nature of the subject will allow. The compiler has sought no scientific fame; his only wish has been to afford some useful knowledge to such of his countrymen as have not the means of seeking it in a more elaborate form; and if he should thus be able in some cases to give his readers a more enlarged view of what, as a whole, is called nature, *i. e.*, the aggregate of the forces and their results, by virtue of which the visible world has become what it is:—if by a clearer view of these he should enable him also to arrive at a clearer view of the Supreme Mind which impressed its own stamp on the whole:—if in addition to this he should have given the busy man assistance in his honest calling, or aided him in preserving health to pursue it, he has gained his object, and seeks no other reward than the consciousness of having endeavored to be useful in his generation. Many years probably will not elapse ere he will have to give an account of the talent entrusted to him; but he knows that the Master he has served is wont to look rather at the motive of his servants, than at the imperfect execution of their purpose:—to that generous Master he dedicates his small work.

## INTRODUCTION.

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### 1.

THE material substances which compose the earth, its atmosphere, and its inhabitants, are continually changing their forms and combinations, though remaining the same in quantity; for, as far as we can tell, no atom of the material universe is ever lost, through all its multiplied transformations. The science which takes cognizance of the laws by which such changes are wrought is called Chemistry.

2. The substances thus wrought upon are either *inorganized*,—as stones, earths, &c.; which are without any internal mechanism for effecting such changes; or *organized*, as plants, animals, &c., which are possessed of a systematic mechanism for attracting and assimilating other substances, and effecting constant change in their own constituent parts.

3. All substances, whether organized or inorganized, are resolvable into certain elements;—that is, substances which, as far as we know at present, contain only one kind of matter. These are supposed to be about fifty-five,\* of which four chiefly contribute to

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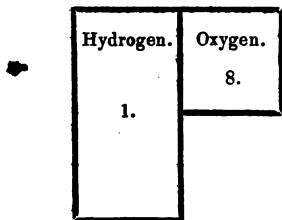
\* These consist of the metals, in number about forty-three, and twelve other substances more difficult to characterize. *i. e.* 1. Oxygen. 2. Chlorine. 3. Iodine. 4. Bromine. 5. Fluorine. 6. Hydrogen. 7. Nitrogen? 8. Sulphur. 9. Selenium. 10. Phosphorus. 11. Carbon. 12. Boron. *Brandes's Man. of Chem.* p. 350, 5th ed. Silicon, or the basis of flints, is by some reckoned as a metal, by others as one of the substances allied to Boron, &c.

the formation of organized matter, though about eight more enter into it in small proportions.

4. All material substances are conjectured to be composed of indefinitely small atoms which are capable of being more or less separated under different circumstances; and thus all are considered as susceptible of three forms—*i. e.*, solid, in which they are so closely pressed together as to resist our touch:—liquid, in which being less compact, they yield to it:—aëriform, in which they are so widely separated as nearly to elude it. Thus, most metals, at a sufficiently high temperature, first become fluid, and at an increased degree of heat pass off in vapor.

5. All elementary substances combine in definite proportions; as 1 to 1,—1 to 2,—1 to 3, &c.\* If, on mixing two substances, there be more than enough

\* In the course of this work the definite quantity of any substance capable of uniting with another substance, will be termed a proportional or equivalent part, whatever its bulk or weight may be. The proportion of hydrogen which unites with oxygen to form water is generally assumed as the unit, hydrogen being the lightest known substance; and the following diagram may then be considered as representing the relative bulk and weight of one proportional part of hydrogen and one of oxygen.



*i. e.* the same bulk of oxygen would weigh 16 times as much as hydrogen does. Thus half the bulk and eight times the weight, forms the definite proportion in which oxygen unites with hydrogen in the formation of water.

for one proportion and not enough for the next, the surplus remains uncombined.

6. All elementary substances have a certain disposition to unite with other substances, which is called *chemical affinity*: and when to two substances already in combination, a third is presented for which either of the first has a greater attraction, it quits its former companion and passes into combination with the new one, leaving the first free.\* The combinations thus formed, whilst their union remains unbroken, may be considered as compound atoms, which are capable of entering into other combinations. As, for instance, an acid, which is a compound of two elements, has a strong affinity for an alkaline base, which is also a compound of two elements. Their combination forms a third substance, unlike either; yet from it the original compounds may be recovered. In some cases these original compounds are decomposed with great difficulty.

7. Chemical combinations as well as their decomposition are mainly effected through the influence of an agent whose mode of action is as yet in some degree unknown. We call it *electricity*. If a glass tube, or a piece of sealing wax be rubbed, the first with a warm dry silk handkerchief, or the second with a warm dry flannel, they will be found, whilst thus excited, to possess the power of attracting light bodies, such as feathers, &c.; but as soon as the feather has been in contact with the glass or the sealing wax, if again brought near, it will be steadily repelled; for the excited body has communicated its excitement to the feather, and it is a law of electricity that *bodies similarly excited repel each*

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\* This action was formerly called, after Bergman, *elective affinity*.



*other.* The electricity of glass when rubbed is *positive*,\* and the feather by contact has become *positively* electrified. It will now be attracted by the sealing wax in which the rubbing has excited negative electricity: for *bodies differently electrified attract each other*; and in like manner a feather which, by contact with the sealing wax, has acquired negative electricity, will now fly from the body which first excited it, and be attracted by the different electricity of the glass. If, after having tried this experiment, the feather be brought near either the silk or flannel rubber, it will be found to approach the silk, if it flies from the glass; and the flannel, if it flies from the sealing wax, and vice versa; thus showing that *in case of friction, the rubber and the substance rubbed will be differently electrified.* If the above experiment be made in the dark, a pale light or sparks will be seen to issue from the excited substances with a slight crackling noise. Upon a larger scale the same agency produces lightning, which is but a large electric spark passing from one excited body to another dissimilarly excited. The mode in which clouds, electrically excited, attract or repel each other in spite of wind, is to be explained by the first-mentioned laws of electricity.

8. If two metals, platinum and zinc, for instance,—be placed together alternately, so that at one side the platinum, at the other the zinc be outermost; and a wire be attached to each of the outside plates,—as soon as the whole is brought into activity by some fluid which acts chemically on either of the metals, and at the same time connects them, the wire attached to the corroded metal, which in this case will

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\* This was at first called *vitreous*, and the *negative* state excited in sealing wax by friction *resinous* electricity.

be the zinc, will be found positively, whilst that attached to the uncorroded, which will here be the platinum, will be found negatively electrified. Whilst the wires remain in contact a silent electric action is kept up in the circuit thus formed, which somewhat raises the temperature of the battery, as this system of plates is called, but is not otherwise perceptible; but if the circuit be broken by removing the wires to a small distance from each other, then the action already going on in the wire communicates itself to the intervening particles of air, and light and heat are evolved so intense, if the battery be a powerful one, as to equal the sun in brilliance, and fuse the most refractory metals.\*

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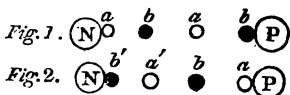
\* As the researches of Professor Faraday have thrown much new light on the subject of electricity, it may be useful here to explain the terms which he has adopted in his writings on the subject. Considering electricity as a force acting along a series of contiguous particles in one or another direction, he terms the respective ends of the wires *electr-odes* from ὁδος a road or way. Then hypothetically assuming electricity to be a movement due to the contrary movement of the earth, he considers this movement to be communicated in the same course with that apparently followed by the sun; and from ἀνω up, i. e., the sun's rising, and κάτω down, i. e., the sun's setting, he forms *an-ode* and *cath* or rather *kath-ode*, to express the respective parts of the *dielectric*; i. e., the substance acted upon by electricity: the *anode* being the part at which electricity may be said to enter the dielectric, the *kathode* that at which it leaves it. The *anode* therefore is that part of the dielectric which is nearest the zinc or positive wire, and therefore according to the law of electricity it will itself be negative; while the *kathode*, being nearest the platinum or negative wire, will be positive, and transmit the action. Bodies capable of decomposition by electric action, he terms *electro-lytes*, from λυω dissolve; and the component parts of these bodies he terms *ions*, from ἰον a thing that goes, and as there are certain classes of substances which show themselves at the *anode*, and others at the *kathode*, he terms these *an-ions* or *kat-ions* according to their natural tendency. Thus water, being decomposed by electric action, the oxygen will show itself at the zinc wire: the water surrounding that wire

9. If, when a galvanic battery\* is thus excited, the two electrode wires be plunged into water, bubbles will be seen to arise; if then glass vessels capable of receiving the gas thus disengaged be placed over the wires, it will be found that oxygen gas has passed off from the positive, and hydrogen from the negative wire: the water gradually diminishes, and the whole is at last decomposed into its elements; the oxygen occupying exactly half the space occupied by the hydrogen and weighing eight times as much. In this manner *all substances composed of only two elemental parts*, seem capable of separation by electric action† as long as they are in a fluid state.

is the anode of the dielectric, therefore oxygen is an an-ion, and in its nature negative; the hydrogen is evolved at the platinum or negative wire: the water round that is the kathode; and hydrogen is accordingly by nature a kat-ion. Oxygen, chlorine, acids, &c., are an-ions; combustible bodies, most metals, alkalies, and bases are generally kat-ions.

\* This arrangement of electric force is sometimes called a galvanic battery, sometimes a voltaic pile; from the names of the discoverers of this form of electricity,—Galvani and Volta.

† In explanation of this fact Professor Faraday proposes a theory so consonant with all the phenomena, and so simple at the same time, that it is impossible not to receive it as the truth: for it has the stamp of every true law of nature, power and simplicity. “Electro-chemical decomposition,” he says, “appears to me to be produced by *an internal corpuscular action*,” as thus:



“The effect,” he says, “is considered as essentially dependent upon the mutual chemical affinity of the particles of opposite kinds. Particles *a a* fig. 1, could not be transferred or travel from one pole N towards the other P unless they found particles of the opposite kind *b b* ready to pass in the contrary direction: for it is by virtue of their increased affinity for those particles,

Chloride of silver, for instance, when fused will evolve chlorine at the positive wire and brilliant metallic silver at the negative.\* Compounds of a more complex nature sometimes resist voltaic action and sometimes are decomposed by a secondary action arising from the affinity of some of the parts for the fluid or the metals of the battery.

10. The source of voltaic electricity is the chemical action of the oxygen of the connecting fluid on the metal which by its position is positive. Thus much is proved; but *how* the chemical, or electrical force which appears to be almost identical with it, acts on or by the particles of matter, remains still a subject for farther investigation; for though natural organs, as in the gymnotus and the torpedo, magnetic force, electricity produced by friction on a glass cylinder, and lightning, are all identical with voltaic electricity in their effects, their causes remain as yet more obscure. The magnetic power communicated to a piece of common soft iron by a helix, *i. e.*, a spiral coil of copper wire wound round it, as long as this wire forms part of a voltaic circuit,—seems

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combined with their diminished affinity for such as are behind them in their course, that they are urged forward: and when any one particle *a* fig. 2, arrives at the pole, it is excluded or set free, because the particle *b* of the opposite kind, with which it was the moment before in combination, has, under the superintending influence of the current, a greater attraction for the particle *d* which is before it in its course, than for the particle *a* towards which its affinity has been weakened.—In proof of this may be given the fact that many substances which either do not conduct electricity at all, or very feebly, in a solid state, conduct freely, and generally with a decomposition of the constituent parts, when made liquid. *Faraday's Experimental Researches in Electricity*, 4th and 5th Series. See also *Davy's Elements of Chem. Phil.*, p. 487.

\* *Faraday's Researches*, 8th Series.

to indicate some natural polarity in the particles of matter which shows itself as soon as some moving cause has placed them in the requisite position; for the magnetism ceases as soon as the circuit is broken by disconnecting either end of the wire from the battery:—but as this is no place for hypothesis, the reader must seek for information on this head elsewhere.

11. The elementary substances which form the chief ultimate constituents of organic matter, are Carbon, Hydrogen, Nitrogen,\* or as it is sometimes called, Azote, and Oxygen: besides these, small portions of Sulphur, Phosphorus, Chlorine, Iodine, and a few of the metals enter occasionally into organic compounds. Of these, Oxygen, Chlorine, Iodine, Sulphur, Phosphorus, Nitrogen, and Carbon belong to the class of An-ions†—the metals belong chiefly to that of Kat-ions, as does Hydrogen, if we may judge from the place it takes when water is decomposed.

12. Oxygen is the most generally diffused of all these elements, and performs the most important part in nature: for besides constituting a large part of the atmosphere which surrounds the earth, it en-

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\* The experiments of Mr. Knox,\* if confirmed by further examination, will remove nitrogen from the class of elementary substances. Sir H. Davy suspected that it had a metallic base from the property which ammonia (a compound of nitrogen and hydrogen) possesses of forming an amalgam with mercury when submitted to voltaic action in contact with that metal, and from finding occasionally on decomposition more hydrogen than enters into the composition of ammonia. Mr. Knox has decomposed nitrogen into silicon and hydrogen. Silicon probably, though never yet reduced, is a metallic oxide.

† Thomson on Heat and Electricity, p. 438, 2d Edit.

\* Transactions of the Royal Irish Academy, for 1841.

ters into the composition of almost all the minerals found on its surface:—in silica, which is a component part of a vast many of them, it forms half the weight of that earth. In an isolated state it is a gaseous body without taste or smell; in combination, if in large quantity, it produces an acid; thus sulphuric and nitric acids are formed by the union of a large proportion of oxygen with sulphur or with nitrogen. In a less proportion it forms non-acid compounds, termed oxides. One of these we are familiar with in the shape of rust or oxide of iron, which is formed by the action of the oxygen of the air or the water on the metal. The earths are chiefly oxides of metals. It combines rapidly with carbon, giving out heat.

13. Hydrogen has a strong affinity for oxygen, with which it unites to form water. The whole process of decay depends on this affinity, as well as many of the processes for the nutrition of plants. Hydrogen, when in the state of gas, is very combustible, and is the lightest body known, but it is never found in an isolated condition.

14. Nitrogen is very indifferent to other substances, and apparently reluctant to enter into combination with them. When forced by circumstances to do so, it seems only to remain combined by a sort of indolence of nature,\* and is easily separated again. Thus in plants and other organized bodies, the moment that it is released from the control of the vital power, it assists decay by escaping from

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\* If, as before noticed, nitrogen be a compound, this peculiarity is explained; for all bodies formed of compound atoms are more easily decomposed than those which are more simple in their formation. In this case silicon being an *an-ion*, and hydrogen a *kat-ion*, its indifference to other substances is not wonderful.

the compounds of which it formed a constituent part.

15. Carbon has a very considerable range of affinity. It unites with oxygen in two definite proportions, and thus forms two different gaseous compounds, *i. e.*, carbonic acid, and carbonic oxide. The first of these is emitted in immense quantities from many volcanoes and mineral springs, and is produced by the combustion and decay of organized matter. In absolute purity carbon constitutes the diamond: it is more commonly seen mixed with other substances in the form of charcoal, as well as in the mineral called plumbago or black lead, of which, in the purest specimens, it forms nine-tenths.

16. Chlorine at all common temperatures and pressures is a gaseous fluid. It is reckoned as yet among simple substances, and is found in combination with soda in common salt. It combines with oxygen and forms acids.\* Iodine is a soft friable substance, which evaporates easily. It is obtained from sea weed and sponge, and in small quantities from sea water. Like chlorine it unites both with oxygen and hydrogen, and forms acids. Phosphorus is found chiefly in organized bodies: it inflames readily, unites with oxygen and forms acids; and is found in nature combined with lime or with magnesia. For chemical purposes it is obtained from calcined bones. Sulphur is well known. The metals or rather their oxides, combine with acids and form salts.

17. "The substances which constitute the principal mass of every vegetable are compounds of carbon, with oxygen and hydrogen in the proper

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\* It unites with hydrogen to form muriatic acid.

relative proportions for forming water. Woody fibre, starch, sugar, and gum, for example, are such compounds of carbon with the elements of water."\* In other substances the oxygen is in excess, and to this class belong the chief of the organic acids found in plants. In others the hydrogen is in excess; such are the volatile and fixed oils, and the resins.

18. The juices of all vegetables contain organic acids, generally combined with inorganic bases† or metallic oxides. All acids, whether organic or inorganic have a tendency to unite with alkaline bases, and thus form neutral saline compounds. These combinations, whatever be the base, are always effected in definite proportions: that is, one equivalent of an acid always unites with one or more equivalents of a base. Thus one proportion of potash unites with one proportion of sulphuric acid, and forms sulphate of potash; or with two proportions of the same acid, and forms bisulphate of potash: the potash itself being a metallic oxide:— (of potassium.)

19. "Nitrogen is an element of vegetable albumen and gluten: it is a constituent both of the acid and what are termed the indifferent substances of plants, as well as of those peculiar vegetable compounds which possess the properties of metallic oxides and are known as organic bases." Estimated by its proportional weight, nitrogen forms only a very small part of plants; but it is never entirely absent from any part of them. In animal bodies it is found in much larger proportion.

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\* Liebig, Agric. Chem., p. 6.

† Thus called because when combined with acids they form the base of a new substance.



20. The ordinary constituents of atmospheric air may be considered to be :—

	By measure.	By weight.
Nitrogen	77·5	75·55
Oxygen	21	23·32
Aqueous vapor	1·42	1·03
Carbonic acid	0·08	0·10

Extraneous matters, however, occasionally find their way into the atmosphere : in London traces of sulphurous and sulphuric acid are observable, and also of sulphate of ammonia;\* and, during a storm, nitric acid may be formed from the combination of the oxygen and nitrogen of the air effected by electric action. Near the sea traces of salt may be found in it, which sometimes is deposited on the leaves of vegetables. Generally speaking, however, the above proportions remain unaltered, except in confined situations, notwithstanding that the innumerable animals which respire atmospheric air return a volume of carbonic acid equal to that of the oxygen in the air absorbed ; the nitrogen being expired at the same time unaltered ;—notwithstanding, too, that carbonic acid is one of the ultimate products of animal and vegetable decay ; and that immense quantities of this gas are emitted from the depths of the earth in volcanic districts.—Whence comes the oxygen which maintains a constant proportion in the air ? and how is this abundance of carbonic acid disposed of ?—In order to answer these questions the already noticed constituent parts of plants should be taken into consideration. They are found by experiment to evolve a much larger quantity of oxygen during the day, than at any time enters into their constituent parts ; it is there-

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\* Brande's Man. of Chem., 5th ed., p. 452.

fore clear that this substance must be derived from some other source. The elements of vegetable matter are mainly carbon with hydrogen and oxygen in the proportions which form water: and the nourishment of plants must be drawn from the atmosphere through the leaves, or from the soil through the roots. The quantity of vegetable matter produced on 26,910 square feet of forest, meadow, or arable land, yields from 1109 to 1124 lbs. of carbon:\* a quantity so large that were it taken annually from the soil, and, as is usually the case, only a small part of it returned in manure, the proposition of this element would be sensibly decreased in the course of culture: but chemical analysis has proved the reverse of this to be the fact. It remains clear then that the larger part of the carbon found in plants does not come from the soil—and if the researches of Liebig are not altogether fallacious, we must look for the source of it in the atmosphere, where it exists in the shape of carbonic acid. Now carbonic acid contains one proportional part of carbon and two of oxygen: hence, in the process of assimilating the carbon for the growth of the plant, two proportionals of oxygen are constantly liberated. Furthermore, the elements of water are, one proportional of hydrogen and one of oxygen, and as hydrogen nowhere exists in a separate state, those plants which possess an excess of this element must have derived it from the decomposition of water, and they will thus have liberated a further portion of oxygen. Growing plants, therefore, are the constant purifiers of the air, which they render fit for respi-

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\* Liebig, *Ag. Chem.*, p. 19. Sir Humphrey Davy entertained the same opinion as to the function of plants in balancing the state of the atmosphere. *V. El. of Chem. Phil.*, p. 234.

ration by absorbing the carbonic acid gas which it is charged with, and restoring its oxygen disengaged from carbon, which latter substance is retained and assimilated for the nourishment and growth of the plant.

21. One interesting observation here presents itself and deserves to be noted. It is a matter of certainty that when Moses was recording the order of creation, the only writer, be it observed, whose cosmogony presents this order:—he must have been entirely ignorant of the sciences which now enable us to trace it with some degree of confidence. Let us consider the apparent course of creation as these sciences,—chemistry and geology—present it. From the seething matter of volcanoes, carbonic acid, combinations of ammonia in a gaseous form, chiefly carbonate of ammonia, and aqueous vapor are evolved,\* i. e., gases composed respectively of carbon and oxygen, and hydrogen and nitrogen, or a combination of both,† but none of them capable of maintaining animal life; and steam, which is a compound of oxygen and hydrogen. Plants sprout from the earth, and find nourishment for the most luxuriant growth in the gaseous products of the heated mass. The remains of enormous ferns found among deep beds of coal, showing the latter to be the produce of a former vegetation, prove how immense a portion of vegetable matter was produced from gases which no

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\* Neither oxygen, hydrogen, nor nitrogen is found in a separate state in nature.

† Carbonic acid is 2 proportions of oxygen.

	1	carbon.
Ammonia is	3	hydrogen.
	1	nitrogen.

Carbonate of ammonia consists of one proportion of carbonic acid and one of ammonia.

animal could have breathed. The absorption of carbonic acid with the consequent return of a large quantity of pure oxygen to the atmosphere; the greater affinity of hydrogen for the oxygen thus presented than for nitrogen, especially when heat acted in the decomposition of ammonia which would then set free its portion of nitrogen—brought the atmosphere apparently in the course of time to its present composition, and animals then stepped forth upon the earth, to breathe the air, and consume the food already prepared for them. Such is the account which science would give; it differs in nothing from that of Moses.

22. But though the use and interest of chemistry be great, even whilst taking cognizance only of inorganic nature, it assumes higher ground when it enters upon the inquiry into the laws which regulate organized bodies. We there behold operations going on which no human art can imitate, though they are evidently in accordance with the known properties of inorganic matter. We see one force after another added, which does not arise out of any action of the former ones, yet harmonizes with them till, if candid, we are compelled to acknowledge that these superadded forces which we can neither create nor control;—which chemical affinity so far from controlling, at times yields to, though still un superseded—must spring from another and a higher source;—from an Intelligence, in short, which, having given laws to matter in the first instance, knew how to make those laws available to nobler purposes than the mere crystalization of a rock or even the coherence of a planet. It is in these higher operations that we shall now trace the course of chemical action.

## PART I.

### PLANTS AND THEIR NOURISHMENT.

#### 23.

IN the ovum of the animal and the seed of the plant there is a germ of organism, which, under certain circumstances, is brought into activity; and by absorbing and assimilating substances proper for its nourishment, fresh parts are added, and growth ensues. The greater portion of the ovum, or seed, consists of substances, which, when the necessary conditions of warmth, moisture, &c., exist,\* are absorbed and decomposed in the minute vessels of the germ. From the fluids thus generated fresh matter is deposited, which, being permeated by the fluid amid which it is formed, necessarily assumes a cellular or tubular form. The organism having now assimilated the whole substance of the seed, the radicle bursts the skin already softened by moisture, and seeks fresh nourishment in the earth, while the seed leaves push upwards to seek the like from the air. The farther growth of the plant must of course depend on the quantity of substances suited to its increase which lie within its reach; and the whole art of cul-

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\* During the germination of plants electricity is evolved—the carbonic acid disengaged is found to be charged with positive electricity, exactly as in the case of combustion: The seeds themselves in consequence become negative. *V. Thomson on Heat and Elect.*, pp. 445-576. They germinate better when connected with the negative extremity of a voltaic battery than with the positive; for the alkalies requisite to their growth accumulate around the negative electrode.

ture consists in affording the young plant this food; for as no elementary substance can be *generated*, but is only *assimilated* by organism, it is necessary that these elements should be presented to it in sufficient quantity. The exact nature of the power which regulates these processes, and which we term the vital force, is unknown to us as yet. We know that it controls the chemical affinities of inorganic substances so far as to hold some in combination which would not otherwise unite; and to decompose others which, under any other circumstances, are very difficultly decomposed. Like other forces it seems to have a certain limit, and no sooner is its control removed or overpowered than the ordinary laws of chemical affinity resume their sway, and an entire dissolution of the organism takes place.

24. It has already been observed that the elements of increase are derived from the soil and the atmosphere; for, unlike the animal, which requires that its food shall be matter already organized, the vegetable draws its nourishment altogether from inorganic matter. We have seen that abundance of the nourishment requisite for the first vegetation might be obtained from the air, and it is remarkable that the remnants of this vegetation found in coal beds, show it to have consisted of such plants as have the largest extent of leaf, and the least of root; thus presenting an extended surface for the absorption and assimilation of the elements contained in the atmosphere. With the first developed leaf this process commences: during the day carbonic acid is absorbed and decomposed, pure oxygen being given out; but during the night this process of decomposition, which has been excited by light and heat,\*

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\* Even among inorganic substances light is generally necessary to facilitate the process of decomposition. This is

ceases; and the carbonic acid which is absorbed, either by roots or leaves, is given out again undecomposed. The oxygen of the air now resumes its powerful chemical action upon the plant; mixes with its component parts, and forms acids.\* A curious proof of this is afforded by the leaves of the *Cotyledon calycinium*, the *Cacalia ficoides* and others; for they are sour like sorrel in the morning, tasteless at noon, and bitter at night. The formation of acids is effected during the night by a true process of oxidation: these are deprived of their acid properties during the day and evening, and by the separation of a part of their oxygen are changed into compounds containing oxygen and hydrogen, in the same proportions as water, which is the composition of all tasteless substances, or, as the day advances and more oxygen is separated, with an excess of hydrogen, which is the composition of all bitter substances.† Hence we may account for the greater quantity of acid in fruits ripened during cold

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greatly accelerated by the direct hot rays of the sun: in some cases the rapidity with which the change takes place under these circumstances is such as to occasion explosion, as in the case of chlorine and hydrogen.

\* Sir H. Davy found that acid and alkali might be obtained from a growing plant by making it a medium of communication between the two extremes of a voltaic battery: wires from these extremities were plunged into two cups of distilled water, and the cups were united by means of a sprig of mint dipping into both. In ten minutes potash and lime appeared in the negative cup, while an acid was found in the positive cup.—*V. Thomson on Heat and Electricity*, p. 574.

The action of weak currents of Electricity in many of the great operations of nature is only just beginning to be studied: much that is now obscure in the growth and assimilation of vegetable bodies will probably be found to have its origin in the different electric states produced by the sun's rays, or the variations of the atmosphere.

† Liebig, *Agric. Chem.*, p. 32.

cloudy summers, when, from the lack of the sun's direct rays, the process of decomposition is comparatively slow; or in those ripened artificially in winter, when there are fewer hours of daylight. Hence, too, as the nights grow longer, the alteration of color, and final dropping off of leaves:—the quantity of oxygen absorbed during the absence of the sun, effects changes greater than the short, and often cloudy days of winter can remedy; less carbon is assimilated,—the leaf loses its green color,—decay commences,—and it falls off.\*

25. Besides woody fibre, which consists of carbon, with hydrogen and oxygen in the proportion which forms water; starch, sugar, and gum, which are formed of the same elements, though with a less proportion of carbon;—caoutchouc, wax, fat, and volatile oils, which consist chiefly of carbon and hydrogen;—plants contain other substances into which nitrogen enters as an element, and which are indispensable to the nourishment of the animals feeding upon them. “These important products of vegetation are especially abundant in the seeds of the different kinds of grain, of peas, beans, and lentils; and in the roots and juices of esculent vegetables. They exist, however, in all plants without exception. These nitrogenized forms of nutriment in the vegetable kingdom may be reduced to three or four substances, easily distinguished by their external characters. When the newly expressed juices of vegetables are allowed to stand, a separation takes

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\* Evergreen leaves absorb less oxygen from the atmosphere than others. The leaves of the *Ilex aquifolium* absorb only 0.86 of their volume of oxygen gas in the same time that the leaves of the poplar absorb 8, and those of the beech 9½ times their volume.



place in a few minutes. A gelatinous precipitate is deposited, which, when washed from the coloring matter, becomes a grayish white substance, which has been termed *vegetable fibrine*. The juice of grapes is especially rich in this constituent: but it is most abundant in the seeds of wheat, and of the cerealia generally. It may be obtained from wheat flour, it is then called *gluten*, but the glutinous property belongs to another substance, present in small quantity which is not found in other cerealia. The second nitrogenized compound remains dissolved in the juice after the separation of the fibrine; but the moment it is heated to the boiling point, it separates as a coagulum, which cannot be distinguished from that formed by the serum of blood, or the white of an egg when boiled in water. This is *vegetable albumen*. The third nitrogenized constituent of the vegetable food of animals, is *vegetable caseine*. It is chiefly found in the seeds of beans, peas, &c.;— is soluble in water, does not coagulate when heated, but is coagulated by an acid exactly in the same manner as animal milk.\* The nitrogen which enters into these compounds is derived from the decomposition of ammonia, for the nitrogen of the atmosphere enters into no combinations, and passes off unaltered even when respired by animals. This ammonia is thrown out largely from volcanoes in the shape of carbonate,—that is, combined with carbonic acid—and results also from the decay and consequent decomposition of animal and vegetable matter. Though not readily detected in the atmosphere, its constant presence in rain water shows that it must exist there; but plants probably take it up largely through their roots also.

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\* Liebig, Animal Chemistry, p. 45.

26. Though carbonic acid, water, and ammonia, are necessary for the existence of plants, because they contain the elements from which their organs are formed, other substances are likewise requisite for the formation of certain organs destined for especial functions peculiar to each family of plants.\* These are the salts formed by the combination of organic acids with metallic oxides or bases. *Phosphate of magnesia* in combination with *ammonia* is an invariable constituent of the seeds of all kinds of grasses; it is found in the outer husk; and in the outer part of the leaves and stalk is found a large quantity of silicic acid and potash, in the form of acid silicate of potash.† Sulphate of lime‡ is found in clover, and nitrate of soda in barley; common salt is a very frequent ingredient in marine plants; phosphate of lime is found in oats, and some other seeds, and nearly all vegetables yield traces of oxide of iron, and many of oxide of manganese.§ The sap of trees has generally been found to contain salts of lime and potassa.

27. But besides these salts of mineral acids, which are absorbed from the earth in a state of solution, most plants, perhaps all of them, contain organic acids, all of which are in combination with bases, such as potash soda, lime, or magnesia.||—Now as we know that acids and bases always combine in definite proportions, it follows that if the soil does not produce the base in sufficient quantity to saturate the acid, the plant cannot be in a healthy state. Hence it becomes necessary to choose particular soils for

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\* Liebig, Agric. Chem., p. 90.

† Liebig.

‡ Gypsum.

§ Brande.

|| Viz., the oxides of the metals, potassium, sodium, calcium, and magnesium.

certain plants, or to supply the deficiency in the soil by manure. To supply the silicate of potash, which is so needful to the stalks of the grasses, and especially of wheat, a sufficiency of potash and of silica must exist in the earth; and the want of the former substance in sandy and calcareous soils, renders them unfruitful in corn and grasses, while turnips, and other plants which need little of it thrive exceedingly well. Argillaceous (clayey) soils generally abound in potash, and accordingly are fruitful in grass and corn. But even those will be exhausted of their potash by a recurrence of corn crops, unless it be in some manner restored by carrying back the straw in the shape of manure. Of these crops wheat is the most exhausting; for though the ashes of wheat, barley, and oat straw, consist of the same substances, an hundred parts of wheat straw yield 15·5 parts of such ashes, while that of barley yields 8·54, and of oats only 4·42.\* On the other hand beans contain scarcely any alkalies, buckwheat 0·09 per cent. only; and they are equally poor in the phosphates of lime and magnesia. Lucern belongs to this latter class of plants. Beet, which contains little else than sugar, water, and a small quantity of cellular tissue, is one of those crops which consume scarcely any of the substances required by wheat.†

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\* Liebig, *Agric. Chem.*, p. 143. The learned professor records that a melted vitreous mass was found in a meadow between Heidelberg and Manheim after a thunder storm. This mass was found on examination to consist of silicate of potash. A flash of lightning had struck a stack of hay, and nothing was found in its place but the melted ashes of the hay.

† "Beet root in 100 parts contains about 89 parts water, and 11 parts solid matter, which consists of from 8 to 9 per cent. sugar, and from 2 to 2½ per cent. cellular tissue. Sugar contains 42·4 per cent.,—cellular tissue 47 per cent. of carbon."—*Liebig. Agric. Chem.*, p. 18.

28. It has been proved by experiment that the substances received into the sap, and distributed into the different parts of plants for their renewal or increase, must be in a state of solution—*i. e.*, either liquid or aëriform. This is owing to the minuteness of the vessels whose mouths, thickly set over the roots and leaves, act as a sponge, and absorb whatever fluid comes within their reach, but which, like a sponge, are unable to receive any solid even in the state of the finest dust. These fluids are received indiscriminately; are there decomposed, and, as it were, selected by the organs through which they are transmitted, and all useless portions of them rejected again by the roots, or exhaled through the leaves. This excrementitious matter in time accumulates round the roots, to the exclusion of proper nourishment: hence the benefit of digging hops, &c., which removes the excrementitious matter and supplies fresh soil; yet notwithstanding this, after a time it is found that the soil becomes so impregnated with them as to be unfit for the growth of this species of crop, though exceedingly fertile for a different one. Fruit trees which have ceased to bear well, may be again made fruitful by removing the earth round the roots, and replacing it with fresh soil; and practically it is known that where a tree has died, it is needful to subject the spot to a course of digging and tillage ere another is planted, or the young plant will not thrive.

29. In some cases the substances thrown off by the roots are not rejected merely in the same state as received; they have entered into fresh combinations, and thus present themselves in the form of extractive matter, sometimes resinous and acrid, in which case probably an excess of hydrogen has

contributed to their formation; sometimes mild, resembling gum, which latter, though its ultimate elements are those of woody fibre, *i. e.*, carbon and water, yet contains a less quantity of carbon. Trees whose wood is very solid, and which consequently appropriates much carbon, frequently throw out gum from the bark: it is probably in that case a residuary compound. These excrementitious substances, though useless and even poisonous to the plant which has thrown them off, may in some cases afford nourishment to plants of a different kind; and this is the cause why the alternation of crops has been found practically useful. This again has been found by experiment. The water in which plants of the family of the *Leguminosæ*\* grew acquired a brown color. Plants of the same species placed in water impregnated with these excrements were impeded in their growth, and faded prematurely; whilst, on the contrary, corn plants grew vigorously in it, and the color of the water diminished sensibly; so that it appeared as if a certain quantity of the excrements of the *Leguminosæ* had really been absorbed by the corn plants."† But even if not absorbed, these vegetable excrements, which necessarily contain a considerable portion of carbon, will in the course of tillage be exposed to the action of the atmosphere, the oxygen of which will soon convert carbon into carbonic acid, and hydrogen into water; and thus, in the course of a few years, they may again be a source of fertility. Unslacked lime, by hastening the decomposition of vegetable matter, assists this process; itself absorbing a por-

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\* *Podded*, such as peas, beans, &c.

† Liebig, *Agric. Chem.*, p. 153.

tion of the carbonic acid thus generated, and again becoming a carbonate.\*

30. The decay of vegetable matter generally yields a substance which has been termed *humus*: it consists mainly of carbon, and when exposed to the action of the atmosphere its surface becomes oxidized, and carbonic acid is generated. In careful tillage, whatever portions of this substance may be contained in the soil, are in turn exposed to the air, and give off a portion of their carbon in this manner; thus contributing to the nourishment of the plants growing within its reach—for carbonic acid gas being soluble in water it is absorbed by the roots along with the moisture of the earth. As the oxygen can act only on the surface however, its decay is slow; thus it remains as a store from which a certain portion of the nutriment of plants may be obtained by diligent culture: otherwise, unless the soil should be one which the air easily permeates, it remains inert.—It can only be made available by the presence of oxygen. As charcoal has the same property of forming carbonic acid, it has been found serviceable, when powdered, in promoting the growth of plants.

31. We have seen that the excrementitious matter thrown off by the roots of plants is of two kinds—in the one case it consists merely of inorganic substances which cannot enter into the organism of the plant, and may be considered as undigested

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\* The limestone or chalk from which lime is obtained is itself carbonate of lime, *i. e.*, the oxide of lime, formed by the action of the oxygen of the atmosphere on the metal calcium, combined with carbonic acid. The carbonic acid is expelled by heat, and oxide of calcium is again produced, but this has a great affinity for water and for carbonic acid so that it quickly passes into fresh combinations.

matter : this, though useless to one kind of plant may be needed by another. In the other case it has entered into combination and produced matter which may be decomposed, and again made available to the same kind of plant in the shape of humus. How soon this decomposition shall take place depends on the nature of the soil, but we may take it as a general rule that it will be hastened by alkalies, which, if there be any acids present, will unite with them and form soluble salts, leaving behind the other matters, which consist chiefly of carbon. No manure will make a soil fit for the growth of the same species of plant till this decomposition has taken place, and sometimes this is not till after a lapse of some years.

32. The production of coal beds has been the result of this process of decay under peculiar circumstances. Woody fibre and parts of plants having been found in it in different stages of decomposition, leave little doubt as to its origin ; and as, wherever moisture is present, oxygen is so too, there would be a continued evolution of carbonic acid gas from vegetable matter in a state of decay till all the oxygen was consumed ; but as two proportions of oxygen to only one of carbon are required to form this gas, a considerable portion of carbon must remain, as well as the hydrogen which had been in combination with the oxygen, while both those elements existed in the form of water. The results of a chemical analysis of canel coal from Lancashire justifies this assumption. 24 proportions of carbon and 13 of hydrogen are found in it, but no oxygen.\* The accumulation of carbonic acid gas in mines, wells, caves, &c., is in many

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\* Liebig, Agric. Chem., p. 350.

instances the result of this vegetable decomposition still going on.\* It is well known that the gas produced by distillation of coal contains a considerable proportion of hydrogen, which having little affinity for carbon quits it easily. It was a component part of the water always found in woody and vegetable matter, and was left behind when the oxygen united with the carbon to form carbonic acid. The fire damp of mines, like the gas obtained by distillation, consists mainly of carburetted hydrogen. Bituminous substances have the same origin; they consist merely of carbon and hydrogen.†

33. The nourishment to be afforded to plants may now be easily summed up. They require a large supply of carbon in solution generally found in the shape of carbonic acid; of hydrogen and oxygen chiefly received in the form of water; of nitrogen derived from ammonia, either existing in a gaseous form in the air, or dissolved in the rain water which impregnates the earth round them with its elements:—of potash, soda, lime, magnesia, silica, iron, and manganese, with phosphorus and sulphur in the form of acids forming neutral compounds, chiefly with the above named bases. The art of culture consists in restoring or affording these substances to the *soil*—for the air we are unable to impregnate by any agency of ours;—and in proportioning the allowed growth of the tree or vegetable to the quantity of nourishment at our command. A tree will not form blossoms and fruit unless it has a surplus of nutriment—it will, therefore, form none if all the carbon it can derive from the carbonic acid around

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\* Professor Liebig conjectures that the crystalization of the diamond may be effected in the course of this kind of decomposition.

† Brande.



it, whether in the soil or air, be consumed in the formation of the woody fibre of very numerous branches:—the removal of a few of these in the spring causes an immediate surplus; and hence the pruning of fruit trees makes them bear more abundantly.

34. It has already been noticed that silicate of potash is a necessary ingredient in the stalks of grasses or corn;—that phosphate of magnesia or phosphate of lime is no less needful to the husks of the seed;—and that there are other substances, which form their chief nutritive qualities, into which nitrogen must enter largely.—A farmer who has attended to this will notice if his corn appear weak in the stalk, and will endeavor to supply the first of these substances: it will be found in the decomposition of straw; it may be even obtained in mass under the title of soluble glass. If the ears be small and insufficient, the phosphates may be supplied from bone dust, which consists mainly of the phosphates of lime and magnesia,\* or from bran which has been used in print works, which contains these phos-

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\* “The manure of an acre of land with 40lbs of bone dust is sufficient to supply three crops of wheat, clover, potatoes, turnips, &c., with phosphates. But the form in which they are to be restored to a soil does not appear to be a matter of indifference. For the more finely the bones are reduced to powder, and the more intimately they are mixed with the soil, the more easily they are assimilated. The easiest mode of effecting their division is, to pour over the bones in a state of fine powder, half their weight of sulphuric acid diluted with three or four parts of water, and after they have been digested some time, to add one hundred parts of water, and sprinkle this mixture over the field before the plough.” Liebig. Agric. Chem., p. 173. It must be remembered that when sulphuric acid is to be diluted, *the acid must be slowly added to the whole quantity of water*, or a degree of heat will be generated which may be mischievous. The corrosive nature of sulphuric acid renders great caution needful in the use of it.

phates, after it has served the purpose of the manufacturer; or from the excrements of animals which have been fed upon corn.\* The nitrogenized products must be increased by a supply of ammonia, and this may be gained in different ways. All animal excrements contain it:† the decay of animal and vegetable matter affords it in notable quantity; and gypsum (sulphate of lime is sometimes exceedingly useful in fixing these ammoniacal compounds thus formed, no less than that which is found in rain water. "The carbonate of ammonia contained in rain water is decomposed by gypsum, soluble sulphate of ammonia, and carbonate of lime, are formed; and this salt of ammonia possessing no volatility, at common temperatures, is consequently retained in the soil. All the gypsum gradually disappears, but its action upon the carbonate of ammonia continues as long as a trace of it exists."‡ If gypsum be strewed on the

\* Five hundred grains of horsedung on being subjected to chemical analysis were found to contain:—

Water	357 . 0
Vegetable fibre and animal matter	135 . 0
Silica	3 . 2
Phosphate of lime	0 . 4
Carbonate of lime	1 . 5
Phosphate of magnesia and soda	2 . 9
	500 . 0

† It should, however, be noticed, that the extremely volatile nature of this substance leads to its almost immediate escape into the surrounding atmosphere; and thus, when manure of this kind is laid in a heap, and turned, as is the practice with farmers, this most valuable constituent part is almost entirely lost.

‡ Liebig, Agric. Chem., p. 85. It must, however, be remarked, that gypsum requires water to produce its effects.—Liebig recommends a salt more easily soluble in very dry land—chloride of calcium, for instance. In England, however, the winter's rain will generally supply moisture enough.

floors of stables it has the same effect: by decomposing the ammoniacal salts which are formed, and which form the disagreeable odor by their constant volatilization, it fixes them as sulphate of ammonia, and thus no part of the manure is lost; and this can afterwards be carried out upon the land. It has the further effect of destroying the unpleasant odor; for these odors, in this, as in other cases are the result mainly of volatile ammoniacal compounds. Where grasses are scanty in leaf, a larger supply of potash will generally increase the crop;—and this substance will be found abundantly in wood ashes—in the excrements of the cow and sheep, which contain but little nitrogen;—and of course it may be supplied from the potash of commerce. If it be suspected that there is a want of carbon, powdered charcoal may be strewed on the soil: this will be found useful in heavy soils; coal ashes, too, or burnt earth, or fine gravel, will act mechanically on such soils, by dividing and making them permeable to the atmosphere, and thus increase their fertility. Chalky soil might be improved by pouring dilute sulphuric acid upon it, which by converting the chalk (carbonate of lime) into gypsum (sulphate of lime) would create this useful substance upon the spot. It will follow from what has been said that the only use of fallowing ground, exclusive of the mechanical one of destroying troublesome weeds, consists in the opportunity it affords of turning up fresh surfaces to the action of the atmosphere, and recruiting its nitrogen by the rain water which falls on it. It may therefore be a matter of calculation to the farmer, whether he may not find the manure requisite to supply the place of this less costly than the loss of a crop.

35. Besides the nitrogenized products already

mentioned, there are in plants other compounds destined to play an important part both in the support of graminivorous animals, and in the reproduction of the plant itself. "A new and peculiar process of vegetation ensues in all perennial plants after the complete maturity of their fruit. The stem of annual plants, at this period of their growth, becomes woody, and their leaves change in color;—they have no further increase to provide for:—the leaves of trees and shrubs, on the contrary, remain in activity until the commencement of winter; but after August they form no more wood; all the carbonic acid which the plants now absorb, is employed in the production of nutritive matter for the following year. Instead of woody fibre starch is formed, and is diffused through every part of the plant by the autumn sap. The barks of several aspens and pine trees contain so much of this substance, that it can be extracted from them, as from potatoes, by trituration in water. It exists also in the roots and other parts. A very early winter, or sudden change of temperature, prevents the formation of this provision for the following year; the wood is said then not to ripen, and its growth the next season is very limited.\*

36. The starch accumulated in the autumn in the bark of the root, and the seed, under the requisite conditions of moisture and warmth, is converted into sugar and gum,† and from this the bud, the young plant, or the leaves of the bulb, derive the juices

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\* Liebig. Agric. Chem., p. 119.

† The elementary proportions of starch are, carbon 12, hydrogen 10, oxygen 10,—or, a certain quantity of carbon combined with the elements of water. It becomes gum by the addition of one proportion of water—(for the formula of gum is carbon 12, hydrogen 11, oxygen 11,) and sugar by a still farther addition of water—(sugar from starch contains carbon 12, hydrogen 14, oxygen 14.)

which enable them to form a fresh organism and derive fresh nutriment from the atmosphere. Every one knows practically, that when potatoes have germinated they become sweet, and their mealiness is lost: the starch is become sugar for the support of the young shoot. It is thus that barley is converted into malt; by supplying the conditions of moisture and warmth, the seed is made to germinate, and the starch contained in it is thus converted into sugar. The process of growth is arrested before this sugar is consumed for the nourishment of the young plant, by subjecting the grain to the heat of a kiln; and thus the sweetness is preserved.

37. The quantity of either starch or gluten contained in the plant, depends on the kind of nourishment it is supplied with: when manures, containing nitrogen, have been used, the nitrogenized products will be increased, and the starch lessened, and vice versâ. Thus potatoes grown in a soil which has been treated with animal manure, which contains much nitrogen, have a gluey consistence; while those grown in a fresh soil where humus abounds, have more of starch, and are what is called mealy. Wheat is influenced in the same manner, and gives a larger proportion of gluten or of starch, according to the manure that has been used on the soil.

38. We have now traced the great laws of vegetable life, but there are still some remarkable processes connected with vegetable death, which remain to be noticed. These are what are commonly termed fermentation, putrefaction, and decay.

39. We have already seen the facility with which starch changes into sugar, and sugar into other products, in the living organism, by the addition or subtraction of the elements of water; for it can hardly be doubted that the sweet juice of the young grain,

is in itself the foundation of the flour in the ripe one; a portion of water has been abstracted from the sugar, and it is again become starch. When the juice of fruits containing saccharine matter, or a solution of grain, in which the starch has again been converted into sugar, is exposed to the air, two fresh substances (carbonic acid and alcohol), are engendered, and the sugar disappears—the process by which this is effected, is commonly called fermentation. On examination, these two products will be found to contain the original elements of the sugar differently arranged, and with the addition of a certain proportion of the elements of water. The immediate cause of the change appears to be a nitrogenized substance in the juices of the plant, which has been termed albumen or gluten. The peculiar indifference of nitrogen to other elements, has been noticed; no sooner is it free from the vital force, than it seeks its liberty; the elementary atoms are thus set in motion, and like grains of cork floating in water, group themselves afresh according to the most powerful affinity: the movement is propagated from one to another, and ceases not till all have ranged themselves in their new combinations. When the carbonic acid, which escapes in a gaseous form from fermenting sugar, and the alcohol which remains in the liquor are analyzed, it appears that the elements of the sugar are there, with a slight addition of oxygen and hydrogen,\* the known elements of water, which has probably been absorbed from the air in the course of the chemical

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\* Cane sugar contains the elements of carbonic acid and alcohol, minus one proportional part of water. The alcohol and carbonic acid produced by its fermentation, contain together one equivalent of oxygen, and one of hydrogen, (that is, one proportional of water,) more than the sugar contained. *Liebig, Agr. Chem.*, p. 183.

change going on. Other products also are found, the result of the decomposition of the nitrogenized matter.

40. Whilst the decomposition of the vegetable albumen is still going on, it is termed yeast or ferment, and if a portion of it be taken from the fermenting liquor, and added to any other saccharine matter, it has the property of communicating its state of chemical change, *i. e.*, movement—to that also. The process is repeated, and the results are the same; with this difference merely, that if the substance which the yeast has been introduced into, contains no albumen, it disappears after a time, all its parts having entered into fresh combinations; whereas if it meets with albumen, it communicates its state of decomposition to this also,—and a larger quantity of ferment is the result. It sometimes happens that if the quantity of albumen be sufficient to keep up this state of chemical movement, even the fresh combinations are disturbed; the oxygen of the air is attracted, and the alcohol having a larger quantity of oxygen added to its other elements, becomes acetic acid. By preventing the access of atmospheric air, this change may be prevented, for the great element of the change is then wanting.

41. Putrefaction is another result of the disposition of nitrogen to escape from, or change its companions. As soon as a body, in which the vital force has ceased to act, and which contains nitrogen, is exposed to moisture, the nitrogen combines with the hydrogen of the water, and the carbon with the oxygen, and thus ammonia and carbonic acid are evolved—the atoms once set in motion run through a course of different combinations, and for the most part disappear in a gaseous

form, leaving, at last, nothing but the bony structure behind. The disagreeable odors emitted by bodies in this state of change are these gaseous products,—compounds, in various forms, of hydrogen and nitrogen,—for oxygen and carbon are in-odorous.

42. Decay is the gradual oxidation of organized bodies, where there is not moisture sufficient to admit of the rapid changes which take place in fermentation and putrefaction. The carbon of the decaying body unites with the oxygen of the atmosphere in the proportion of one to two, and is thus slowly abstracted: or, as in cases where it is in great measure secured from the access of air,—with its own oxygen; leaving an extra quantity of hydrogen, as has already been noticed in the instance of coal. Human bodies, when kept perfectly dry, do not putrefy, but become shrunken and dark-colored.

43. We have now traced the general laws by which organic compounds are formed, and again decomposed—most simple even in their complexity; accomplishing the most enormous results by means as small in appearance as they are mighty in operation. “Carbonic acid, water, and ammonia, contain the elements necessary for the support of animals and vegetables. The same substances are the ultimate products of the chemical processes of decay and putrefaction. All the innumerable products of vitality resume, after death, the original form from which they sprang. And thus death—the complete dissolution of an existing generation—becomes the source of life for a new one.”\*

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\* Liebig, Agr. Chem., p. 89.



## PART II.

### ANIMALS AND THEIR NOURISHMENT.

#### 44.

WE have seen that among inorganic substances combinations are effected, and changes wrought by means of a peculiar property, which, till better understood, has been termed chemical affinity. In plants a new principle is superadded, and chemical affinity is modified by a mechanism which, under the external influence of light and heat, causes fresh combinations and products, and possesses the power of growth and reproduction. In the animal this mechanism no longer requires external influence, but contains within itself the mainspring which regulates its movements. This mainspring is the apparatus of the nerves.

45. Assimilation, or the process of formation and growth, goes on alike in the plant and the animal; in both it is carried on unconsciously, and thus far the difference between the two lies only in the *source* of motion. The lower order of animals possess merely the organs of this vegetative life, but as we ascend higher, we find new organs introduced, nerves of sensation receive impressions from without, and propagate their movements through nerves of motion; higher yet we find sensation concentrated in the brain, and voluntary movement transmitted from thence to the limbs.

46. In man, we find a more delicate mechanism acting as the organ of a farther force, which manifests itself in the higher mental phenomena, and which occasionally accelerates, retards, or disturbs the process of vegetative life. Of its nature science can say little; we only know that it exists, that in its action it is frequently independent of external sensations, and that in so far as its manifestations are connected with matter, its agency "is entirely distinct from the vital force, with which it has nothing in common. Thus two forces are found in activity together; but consciousness and intellect may be absent in animals as they are in living vegetables, without their vitality being otherwise affected than by the want of a peculiar source of increased energy or of disturbance. Except in regard to this, all the vital chemical processes go on precisely in the same way in man, and in the lower animals."\*

47. The first process of vitality is assimilation. The young animal, like the germ of the plant, has a peculiar nourishment and shelter provided for it during the first stages of its growth; and like that, its increase of mass proceeds from a fluid which conveys and deposits the matter requisite for the formation and increase of each organ; and as in plants, too, these must be received in a state of solution. The young animal receives its food in a fluid state: it is the office of the stomach in after life, to reduce to that state such parts of the solid food received, as may be fitted for nutriment. In either case, the fluid is absorbed by minute vessels, which, like those in the root of a plant, act as a sponge, and suck in whatever liquid is presented to them,

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\* Liebig, Anim. Chem., p. 6.

without discrimination. The fluid, which is the final result of the moisture thus obtained, we term *blood*; and by depositions from it, all increase of mass or reproduction of parts is effected. The matter deposited amid a permeating and circulating liquid necessarily assumes, as in plants, the form of tubes and cells.

48. At a certain period of its growth the young animal, like the young plant, requires fresh nourishment, and breaks forth from its first shelter to seek it. It is now subjected to the action of the atmosphere, respiration ensues, and thenceforth air is no less needful to life than food; nor can any other air than the precise mixture of gases found in the atmosphere, be respired long without danger. At every breath a certain quantity of this air is enhaled: the same volume of air is exhaled a moment after, but its qualities are changed; the nitrogen is indeed returned unaltered, but the oxygen has disappeared, and in its room we find carbonic acid and watery vapor. The weight of oxygen thus abstracted from the atmosphere daily is considerable,\* yet we find no increase of weight in the body receiving it, if it be that of a full-grown animal. It is evident then that it does not remain in the system, and we find in fact that it escapes in combination with carbon and with hydrogen, which two elements, combined with oxygen, form respectively carbonic acid and water. The elements for this combination then must have existed in the body. It is well known that gases possess the power of penetrating membranes; and thus the oxygen of the atmosphere when received into the lungs,

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\* An adult man inhales on an average 32½ oz. of oxygen; a horse 13 lbs. 3¼ oz.; a milch cow 11 lbs. 10¼ oz. in twenty-four hours.

penetrates the coats of the vessels there exposed to it, and finds its way into the blood. Oxygen is too powerful an agent ever to remain inactive; a course of chemical combinations takes place, the blood is changed in color and properties, and carbonic acid is evolved. A large proportion of chemical combinations are attended with the evolution of heat, as may be seen in the processes of fermentation and putrefaction, if the mass be sufficient to prevent the heat from escaping, and among these are the combinations taking place within the living body. Carbon forms a large constituent part of all food, as well as of all the tissues of the body; now a charcoal fire is nothing more than carbon in a state of rapid combination with the oxygen of the atmosphere,\* during which also carbonic acid is largely evolved. The combination which takes place in the body is not so rapid, but it is of the same nature. "Respiration is essentially a combustion of carbon, which, in combining with oxygen is converted into carbonic acid, and at the same time furnishes the animal heat. Liebig calculates that the amount of carbon daily burned in the body of an adult man, is about fourteen ounces, and that the heat given out by this quantity is fully sufficient to keep up the temperature of the body, and to account for the evaporation of all the gaseous matter and water expelled from the lungs."†

49. But the quantity of oxygen inspired is affected

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\* In what we call "making a fire," we only resort to the same principle which has been noticed § 40. To facilitate combination, we bring a substance, already in a state of chemical decomposition, into contact with the substance we wish to decompose. Combustion, like fermentation, may be spontaneous, but it is hastened and rendered easier by thus artificially throwing the atoms into a state of movement.

† Turner's Chemistry, 6th edit.

by the temperature and density of the atmosphere. At every respiration a volume of air enters, proportioned to the capacity of the chest, but its weight, and consequently that of the oxygen it contains, are not constant. Air is expanded by heat, and contracted by cold, therefore a given volume of cold dense air will contain more atoms of oxygen than an equal volume of warm rarefied air. The oxygen taken into the system is given out again in the same forms, whether in summer or in winter; hence we must expire more carbon in cold weather, because we have inspired more oxygen, and we need more or less carbon in our food in the same proportion: in Sweden more than in Sicily; and, in temperate climates about an eighth more in winter than in summer. "Even when we consume equal *weights* of food in cold and warm countries, the articles of food are most unequal in the proportion of carbon they contain: the fruits on which the natives of the south prefer to feed, do not, in the fresh state, contain more than 12 per cent. of carbon; while the bacon and train oil used by the inhabitants of the arctic regions, contain from 66 to 80 per cent. of carbon."\*

50. All chemical changes are attended with movement of the elements combining: a moving force is thus generated, by which vital activity is kept up; but every such movement is attended with a consumption of the parts employed in giving rise to it. The combination of acid and metal in a galvanic battery which gives rise to extremely rapid movement and intense heat, consumes the metal; and every exertion of muscular force, being the result of chemical change, and consequent consumption of the parts,

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\* Liebig, Anim. Chem., p. 17.

is attended by a proportionate exhaustion and necessity for renewal. Thus strong exercise increases the need for food in two ways; for it occasions more frequent breathing, and therefore a greater influx of oxygen into the system, and at the same time a waste of the substance of the body, which will require to be renewed.

51. In all these cases such is the exact regulation of the organs, that if the natural appetite be gratified, and no more than gratified, the bulk of the body will remain the same, as well as the temperature of the blood; although the body, as a heated mass, follows the laws of other heated masses, and loses heat again in proportion as the surrounding matter is colder or hotter than itself. This equality of the temperature of the blood in all climates is the result of the difference already mentioned in the quantity of oxygen respired. Carbon is the fuel, oxygen makes the fire: now exactly in these cases where owing to external warmth the body loses less heat, and consequently needs less fuel to keep it up, the amount of oxygen inhaled is lessened by the rarefaction of the air. Even in cold climates warm clothing or warm rooms, by preventing the rapid cooling of the body, and the latter by rarefying the air, also lessen the demand for food. Those who remove to warm climates usually find their appetite diminished. "This is a warning from nature to diminish the amount of food taken: and if it were attended to, and the common, but absurd practice of stimulating the appetite by ardent liquors and hot spices, abandoned, Europeans might enjoy as good health in the East or West Indies as at home."\* Hybernating animals which take no food during

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\* Turner's Elements of Chemistry.

considerable periods,\* breathe very slowly,† and grow cold during their winter sleep:—the small amount of carbon burned by the oxygen received in respiration has in this case been supplied from the tissues of the body; for the animal loses flesh during its torpid state; but in order to meet this exigency, the abundance of food in the autumn fattens these animals exceedingly, so that a sufficient supply of carbon is found without fatally consuming the vital organs.

52. In cases of starvation not only the fat disappears, but also, by degrees, all such of the solids as are capable of being dissolved: the muscles shrink, grow soft, and lose their contractility, and with it, their power; till towards the end, the brain itself begins to undergo the process of oxidation, and delirium, mania, and death close the scene; that is to say, all resistance to the oxidizing power of the atmospheric oxygen ceases, and the chemical process of decay begins, in which every part of the body, the bones excepted, enters into combination with oxygen. The time which is required to cause death by starvation depends on the amount of fat in the body: on the degree of labor or exertion of any kind; on the temperature of the air; and finally on the presence or absence of water. Water is a requisite component part of the body, and a certain quantity

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\* The dormouse is a familiar instance of this.

† A bat in a state of torpidity consumed on an average 3.4 cubic inches of oxygen gas in sixty hours: in a state of activity it consumed that quantity in less than half an hour. During the period of torpidity the temperature of the animal was that of the atmosphere. A dormouse when lively, with an external atmospheric temperature of 47°, had a temperature of 92°. The day before, when torpid, its temperature was 52°, the external thermometer then standing at 49°.—*Dr. Marshall Hall on Hybernation, Phil. Trans. for 1832.*

of it being constantly evaporated from the skin and lungs in consequence of a temperature of 98° Fahr., it must be supplied again, or its dissipation would hasten death.\*

53. It has already been noticed (§ 47) that the increase of mass in the animal body, the development of its organs, and of course the supply of waste, are dependent on the blood; for through it alone, the substances can be conveyed which are needful for these purposes. It is evident, therefore, that no substances can be considered nutritious which are incapable of conversion into blood; or which, being rendered fluid, and thus capable of absorption, are yet of a different nature from the usual constituents of any part of a healthy living body. Thus we find that the metals which have no place in the organism in its normal (*i. e.*, natural and usual) state, when absorbed into the system in any considerable quantity, act as poisons and destroy life, and the effect of some of them as medicines, when given in small doses, though still very obscure, probably depends on the unnatural action excited by them, which in some cases may be of service, by expelling diseased or useless matter.†

54. Blood when taken from the body, and thus withdrawn from the vital movement which has kept

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\* Liebig, *Anim. Chem.*, p. 27. He mentions a case where, with a supply of water but no food, life was prolonged for sixty days.

† Some metallic poisons are such from their property of arresting the progress of vital change, which after all, is but incipient decomposition compensated by the activity of the organs in supplying fresh matter and expelling what has been decomposed. *Arsenious acid*, or as it is commonly called, *white arsenic*, stops the process of decomposition in the parts subjected to its influence even after death. *Perchloride of mercury (corrosive sublimate)* has a like property of arresting the progress of decay.



it fluid, separates into two parts; a deep red clot, or coagulum, and a yellowish liquid called *serum*, resembling white of egg, with which it is identical in composition.\* Like that, when boiled, it hardens into a white elastic mass which is termed *albumen*. The gelatinous clot when stirred with a stick adheres to it in soft elastic fibres, and this, which is identical with the muscular fibre, is termed the *fibrine* of the blood. It has already been seen (§ 25) that these substances exist in the vegetables which form the food of the graminivora: in the carnivora they are supplied from the re-dissolution of the bodies they devour. Fibrine and albumen are nearly identical in substance: the following is the analysis of 100 parts given by Mulder:

	Albumen.		Fibrine.
Carbon	- - - - - 54.84	- - - - -	54.56
Hydrogen	- - - - - 7.09	- - - - -	6.90
Nitrogen	- - - - - 15.88	- - - - -	15.72
Oxygen	- - - - - 21.23	- - - - -	22.13
Sulphur	- - - - - 0.68	- - - - -	0.33
Phosphorus	- - - - - 0.33	- - - - -	0.36

but Mulder has also proved that these substances are but compounds of another, and yet simpler compounds, which he calls *proteine* (from *πρωτεῖνω* *I take the first place*) as being the original matter from which not only fibrine and albumen, but caseine† also, are derived.

55. Proteine is composed of carbon, hydrogen, nitrogen, and oxygen only: fibrine, albumen, and caseine, all contain small, but essential quantities of mineral substances, such as sulphur, phosphorus, potash, soda, common salt, and phosphate of lime.

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\* Liebig, Anim. Chem., p. 41.

† Vide § 19.

It has been proved by recent researches that animal and vegetable albumen, animal and vegetable fibrine, animal and vegetable caseine, are respectively identical in every particular. We may therefore assume that they are all compounds of proteine, with small proportions of inorganic matter. In every instance where they have been analyzed, it has been found that the amount of the four first elements in the precipitated proteine is the same as in the fibrine, &c., from which it has been precipitated. It therefore appears that it is one of those original compounds which the animal organism is incapable of preparing for itself: for it passes unchanged from the food to the blood and from the blood to the more solid tissues deposited from it. It has been prepared in the secret laboratory of the vegetable organism, and is so essential to the animal creation that no substance which does not contain it in some shape, will support life. If in the course of animal assimilation it should have passed into actual fresh combinations of its elements, and the compound atom of proteine has been decomposed into another containing more or less of any of these four elements, it ceases to be nutritive. Thus gelatine, which is obtained from the cartilaginous parts of the body, and which, on analysis, shows these elements to be combined in different proportions, is incapable of supporting life. An animal fed upon it dies with the symptoms of starvation.

56. When food passes into the stomach it is subjected to the action of the gastric juice: a clear liquid always found there, but when no food is present, in a neutral state. When digestion has commenced, free muriatic acid\* is found in it, arising

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\* Or according to more modern nomenclature *hydrochloric acid*.

probably from the decomposition of the common salt which is found in greater or less quantity in all that is taken as food, and which is generally sought by graminivorous animals, and by man when he is chiefly graminivorous, probably to furnish this necessary agent in the business of digestion. In the animal texture there is always a portion of it, and accordingly the carnivora do not seek it. But the solvent power of the gastric juice does not depend on the acid, for it is not found till the process of digestion has begun. Prof. Liebig is of opinion that this process is the result of the principle already noticed § 39, 40. He conceives that the surface of the stomach is subjected to a partial decomposition in consequence of the oxygen continually carried thither by the saliva; and that this action is communicated to the food as soon as it is received into it:—a fresh arrangement of atoms is in many cases the result—and in this case salt is separated into its acid and its base. All mineral acids have the power of arresting fermentation, hence the accumulation of the free hydrochloric acid finally puts a stop to further change. The food thus brought into a fluid state, and absorbed in the course of its passage through the stomach and intestines by the small vessels whose mouths open into these viscera, is carried finally into the larger vessels by the action of the heart; which does the office both of a sucking and a forcing pump, and after having drawn the venous blood towards it, and forced it into the lungs, where it is aërated, receives it again, and sends it as arterial blood to the extremities of the body.

57. We have already seen that the action of the oxygen carried by the arterial blood, produces a waste of the surfaces with which it comes in contact, by partial decomposition. The proteine having

given up its carbon, either wholly or in part, to form carbonic acid, and its hydrogen and oxygen in like manner to form water, an excess of nitrogen remains mixed in the blood. As this is now useless, the arterial blood undergoes a filtration in the kidneys, in the course of which, this, with a certain portion of the other elements, is passed off into the urinary bladder, and thus removed from the body. On returning towards the heart, the blood undergoes another filtration through the liver; and here the soda set free by the liberation of the hydrochloric acid in the stomach, and the remaining carbon not any longer entering into the composition of proteine, is separated, with a portion of hydrogen and oxygen, in the form of bile. It was formerly supposed that this was an excrementitious matter, and passed off through the intestines; but later researches have proved that it does not exist in the feces, consequently it must be again taken up into the circulation, where it is supposed to supply the carbon needed for the process of respiration, and the generation of heat.\*

58. Whilst contemplating the action of this nicely balanced machine, the question naturally arises, as to whence the provision is made for the growth of young animals; since so large a portion of the carbon received is consumed in the production of heat. There is a further provision for this. Milk is the nourishment of the young, both of the graminivora and the carnivora, and in this there are, besides the compound of proteine termed caseine, two other products; butter and sugar of milk; neither of which contains any nitrogen, but which

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\* It is impossible to give the details by which these assertions are proved in the compass of this small treatise. In Prof. Liebig's works they will be found at length.

are rich in carbon: thus whilst the caseine is applied to the increase of the muscular parts, bones, &c.,\* the carbon and water of the other two supply the waste of respiration. It is observable that the carnivora, in their wild state, continue to suck till they have attained nearly their full growth: and, when domesticated, we find it needful to supply them with milk, if separated from the mother. In the young of carnivorous birds the total absence of movement so lessens the waste in respiration, that it compensates the want of this peculiar kind of nutriment. Man and the graminivora continue to make non-nitrogenized compounds a part of their food after milk has ceased to be their only nutriment, and thus subsequent growth is provided for. Nothing but a very mistaken view of the animal mechanism therefore could induce any to feed children almost exclusively on a meat diet, and to debar them from the fruit and farinaceous food which their appetite always seeks: for it is in these latter that they find the sugar and starch which supply carbon for the respiratory process, and allow the compounds of proteine to be applied entirely to the support and growth of the body.

59. The same substances which during the growth of the young animal supplied the elements of respiration, and thus allowed an increase of mass, continue to form a considerable part of the food of herbivorous animals, and of civilized man even after this has ceased. If then the amount of oxygen breathed be not enough to consume the carbon of the food, a substance accumulates, which, in the normal state,

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\* "When chemically examined caseine is found to contain a much larger proportion of the earth of bones than blood does, and that in a very soluble form capable of reaching every part of the body."—*Liebig, Anim. Chem.*, p. 52.

only occurs in small quantity as a constituent of the nerves and brain. This substance is *fat*. If we compare the composition of sugar, of milk, of starch, and of the other varieties of sugar, with that of mutton and beef suet, and of human fat, we find that in all of them the proportion of carbon to hydrogen is the same, and that they only differ in that of oxygen, which is deficient. The formation of fat, therefore, like other analogous phenomena in which oxygen is separated in the form of carbonic acid or water, will be attended with the disengagement of heat. This change supplies to the animal body a certain proportion of the oxygen indispensable for the vital processes, in those cases where the oxygen absorbed by the skin and lungs is not sufficient to convert the whole of the carbon fitted for such combination, into carbonic acid.\*

60. In the case of carnivorous animals, or of men confined to an animal diet, the carbon of the flesh and blood must take the place of starch and sugar in keeping up respiration and heat; but 15 lbs. of flesh do not contain more carbon than 4 lbs. of starch: the consumption of the former, therefore, must be much greater when taken alone, than when a portion of vegetable matter is added; and in order to accelerate the waste of the organized tissues, so as to supply the carbon for respiration, long and severe muscular exertion is required. Carnivorous animals kept in a menagerie, and fed without the accustomed exercise of chasing and seizing their prey, are in continual restless motion; and man upon a like diet, feels the same restlessness, and needs the like exercise for the very same reason. Those therefore whose profession, or whose amusements

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\* Liebig, Anim. Chem., p. 93.

are sedentary, would find their comfort increased and health preserved, by avoiding a kind of diet which requires a larger amount of muscular exertion than they ever make, in order to carry on the vital processes; and which, when this is not made, causes a degree of bodily uneasiness which cramps the best efforts of the mind, and much lessens the enjoyment of life.

61. Gelatine is the name which has been given to the jelly-like matter which cartilage resolves itself into wholly; and which is the nitrogenized portion, likewise, of bones, hair, horn, feathers, &c. It is not, like fibrine, albumen and caseine, found in any vegetable matter—and yet it must be formed from the blood.—Prof. Liebig suggests that as “for the same amount of carbon, the membrane and tissues which yield gelatine contain more nitrogen, oxygen and hydrogen than proteine does, it is conceivable that they are formed from albumen by the addition of oxygen, of the elements of water, and of those of ammonia, accompanied by a separation of sulphur and phosphorus:” the sulphur is found in skin, hair, and horn, the phosphorus in the matter of the brain and nerves. But the question seems still involved in some obscurity.

62. Brain and nervous matter is distinct from all other animal tissues, and in its composition is intermediate between fat and the compounds of proteine; it contains nitrogen (which is absent in fats), but in far smaller quantity than is required to form proteine; and is, on the other hand, much richer in carbon than proteine or its compounds. It appears likewise to contain phosphorus as an essential ingredient.\* From the circumstance that gelatine

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\* Turner's El. of Chem.

has less carbon and more nitrogen than the compounds of proteine, while nervous matter has more carbon and less nitrogen; it appears possible that the formation of the two bears some relation the one to the other. The tissue of the brain, especially the gray part, appears to be chiefly albuminous: but the white portions are loaded with the fatty matter above mentioned, which has the character of an acid. It is remarkable that the vegetable alkaloids, which may be reckoned among the most active remedies in medicine, bear no relation to any constituent of the body excepting the substance of the nerves and brain." All of them contain a certain quantity of nitrogen: and in regard to their composition, they are intermediate between the compounds of proteine and the fats. But in one point the substance of the brain differs from them in its chemical composition, for it exhibits the characters of an acid, and contains far more oxygen than the organic bases or alkaloids. We observe that quinine and cinchonine,\*—morphia and codeinet—strychnine and brucia†—which are respectively nearly alike in composition, if they do not absolutely produce the same effect, yet resemble each other in their action more than those which differ more widely in their composition. We find that their energy of action diminishes as the amount of oxygen they contain increases, (as in the case of narcotine,) and that, strictly speaking, no one of them can be entirely replaced by another. If these compounds then are capable of taking a share in the formation, or in the alteration of the qualities of brain and nervous mat-

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\* The active principles of Peruvian bark.

† Ditto of opium.

‡ Ditto of nux vomica and some other plants.



ter, their action on the healthy, as well as the diseased organism, admits of a surprisingly simple explanation.\*

63. Bones are formed of gelatinous tissue and bone earth. The earthy matter forms rather more than half the weight of the bone, and contains a variable proportion of carbonate of lime, but the chief ingredient is a peculiar phosphate of lime. Fluoride of calcium is sometimes, but not always, found in recent bones, in fossil ones always. Teeth contain the same ingredients as bones, but the proportion of earthy matter is greater: nearly 70 per cent. The enamel of the teeth contains no animal matter, and fluoride of calcium is found in it. In rickets the proportion of earthy matter in the bones is much diminished.†

64. Thus far the animal body has been considered in its usual and healthy state; but it is subject to derangements of that state, from external as well as internal causes. The great law of organic matter,‡ by which substances, in a state of chemical change, communicate their movement to other substances at rest, gives rise to many morbid affections. If putrid flesh, that is, flesh in a state of chemical decomposition, be applied to a wound, so as to find access to the blood, even in very small quantity, it communicates its movement to the particles with which it first enters into contact; this to the next, and so on, till the decomposition is complete; and death ensues, unless the progress of chemical change can be arrested, or unless it be slower in its operation than the formation of fresh blood. From this,

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\* Liebig, *Anim. Chem.*, p. 186.

† Turner's *El. of Chem.*

‡ Vide § 33, 34.

as a well-known fact, we may argue as to many more less understood. The virus of small-pox, &c., which reproduces the disease when communicated to the blood of a healthy individual, probably acts in the same way, for though the exact chemical change which takes place has not been ascertained, we may judge from analogy that such is the case. When yeast is introduced into beer to occasion fermentation, it occasions a change in the saccharine matter it finds there, and its elements assume a new form very rapidly, but it acts differently on the gluten. This enters into a state of much slower decomposition, resembling that of the like substance introduced in the shape of ferment or yeast. The same thing probably happens in the human body. The compound atom, introduced whilst undergoing chemical change, communicates movement to all,—but its own peculiar kind of change only to those of a like composition. Thus a nitrogenized compound, in a state of decomposition, sets all the compound atoms round it in motion, and, if the chemical affinity of their constituent parts be weak, causes them to make fresh combinations among themselves by the mere disturbance, as is the case where sugar is fermented by means of putrid blood, or flesh, or yeast indifferently. A change takes place, but no part of the substance introduced finds a place in the new combination. But if this compound nitrogenized atom should find other atoms of a like composition, then it communicates to them its own peculiar state of change as long as it is itself undergoing the process, and the virus, like yeast, is reproduced until the fresh combinations are completed. This may possibly explain the apparently unaccountable circumstance that many diseases can be taken but once. If the chemical action terminate in forming compounds of

a different nature from those in which the action began, then until matter of a like nature is reproduced in the course of time by the organism, the disease cannot be reproduced. It may be that some compounds, when once decomposed, are formed no more: in this case there can be no return of the malady.

65. In the above-mentioned cases the organism probably suffers from a morbid decomposition of its parts, in consequence of the introduction of some substance in a like state of decomposition; and if the vital force, whatever it be, should be unequal to combating this inorganic movement, a total dissolution of the organism must be the result. Instances of this kind go far to prove that the vital force, like other forces by which matter is impelled, has its laws and its limits. Growth, the first effort of the living organism, has its period: the resistance of other forces here curbs the vital force.—A malignant virus overpowers it by a more intense chemical action; and death, the entire termination of its power, seems little else than the gradual encroachment of other forces on this, till the organism, step by step, loses the power of assimilation; the processes of respiration are impeded: and the fire goes out for want of fuel. Our stoves present the type of our own frail life.

## CONCLUSION.

**THERE** is a peculiar characteristic of **TRUTH**, whatever be its subject, that has seldom been noticed as it deserves to be;—namely, its tendency to throw light on objects apparently the most remote. So distinctive a character indeed is this, that it would be almost a conclusive argument against the truth of a theory, if it could be shown that it had no bearing on any science beyond the one to which it immediately applies; and if this be a test of truth, few theories have a larger claim to being received as such than that of Professor Liebig. Without assuming that it has yet, on all points, that experimental proof, which alone can give a stable foundation to any hypothesis, however probable it may be rendered by argument, whoever studies his works cannot hesitate in agreeing with Dr. Gregory,\* that if we “are only at the commencement of a period which promises to be richer in valuable discoveries, and in applications to the benefit of mankind than any which had preceded it,” it is “he who has led the way in those important investigations, the effect of which on the progress of discovery will long be felt.”

It is not alone on Agriculture, on Medicine, or on Chemistry, in general, even, that this new radiance has fallen:—there is scarcely a subject connected with man's existence on this globe, which does not receive some elucidation from it: and many a long

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\* See his edition of Turner's Elements of Chemistry.

established error fades before its light. Among these may be reckoned the opinion, which at one time it would have been almost heresy to question, that the soul and the life are identical. Whatever be the nature of that power, which the learned professor has well characterized as a disturbing force, found only in man, it is clear that it is perfectly distinct from that life which the human being, in common with the whole animal creation, shares with the vegetable. And here the chemist steps in to correct the ascetic and the enthusiast, by showing him that the tendencies of vegetative life neither can nor ought to be rooted out; though it is in the power of the disturbing, or as we might better term it, the intellectual force, to modify their manifestation sufficiently for all the purposes of virtue and of happiness. Again, what more satisfactory answer can be given to the materialist, who would find the whole of man in organized matter, than the proved existence of this disturbing force in the human animal alone: a force by whose influence the phenomena of animal and vegetative life are frequently so palpably altered, as to compel the acknowledgment that it is perfectly distinct from the vital force which manifests itself in those phenomena. The chemist has traced this latter to its elements; he has accounted for the processes of life, and the causes of death; but he has seen in the course of his investigations that another agency exists, and confesses that its nature is inscrutable to him. The vital force has its limits;—to the intellectual we have not yet been able to set any. It overcomes the vital force, and produces death;—we can trace its action no further; but as the agent and the patient must be different, it is at least a rational inference that the agent does not itself share the fate

of the machine, which it has worn out by too much use, or broken in a fit of ill humor.

Doubts have been entertained by some well-meaning persons as to the use of scientific inquiry : it has been thought needless ; and some have gone so far as to think it even hurtful ;—filling us with a vain conceit of human learning, and dangerous to faith, which ought, they say, to be taken from God's revealed will only. Yet if ever a doubt should arise in the mind as to whether what purports to be God's revealed will, be really so—how are we to answer it?—It can only be by the most scrutinizing scientific investigations that we can arrive at the certainty that the Creator and the Lawgiver are the same—that certainty once attained, what doubt can then annoy us?—and that certainty is attainable : for every step in true knowledge brings us nearer to the FOUNTAIN OF ALL TRUTH. The chemist shows that the most probable order of creation would be none other than that delivered down to us by the great Jewish legislator :—the chemist has proved man's dual life :—the chemist has given us some of the best lessons of the wisdom and the benevolence of the Creator : for if the vastness of space, which the astronomer has opened to us, be so crushing to human intellect, as to make man,—the worm—bow in the very dust before Him who measures the heavens in the hollow of his hand,—no less does the almost infinite minuteness of the atoms out of whose regulated movements so fair a world has grown, impress the mind with the Omnipotence of that Being whose influence stretches to objects which *we* cannot even perceive by any of our senses ; and only become cognizant of by reason—that image of God within us.

It would be a curious, but too long, and as yet too

theoretical a research for the present brief sketch, to trace the gradually simplifying principles of science till they might haply be discerned to merge in one\*—to find in the universe a first and a second cause only. Every discovery of modern science has tended more and more to this point: and however wild our grandfathers might have thought such a proposition, no philosopher now will wholly reject it.—It has been seen in the course of the preceding pages that life is but chemical change: and chemical change is but the movement of elemental atoms determined by a law of their nature impressed on them from the beginning. Sound is but the vibration of the air beating on the tympanum of the ear: light the undulation of a perhaps yet more subtle medium impressing the optic nerve: magnetism is a movement of electric origin:—electricity is intense and rapid chemical change—and heat, so closely connected with this latter in numerous phenomena, has by some, perhaps with justice, been considered as a vibration of the elemental atoms already mentioned. It may be long ere experimental proof confirms what as yet can only be considered as a not irrational hypothesis; but should such proof finally be given, we may find at last that Moses, when he wrote, “God said Let there be light, &c.,” did not merely enunciate a sublime idea, but recorded a great fact; little, if at all, understood for nearly four thousand years, but beginning now to loom upon us in the distance, in all its immensity. We have proof from the phenomena attending the polarization of light, that it is, as Huygens long ago asserted, an undulatory movement. Liquids which remain fluid in the dark, crystalize when exposed to

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\* V. Davy's Elements of Chemical Philosophy, pp. 223, 488.

the light;—for it gives the movement requisite to the re-arrangement of their particles:—and if our system, as is not unjustifiably conjectured by some, were originally but a quantity of nebulous matter, gradually solidified, we may as easily conceive the expanded mass crystalizing into shape under the new influence of the undulations of light, as the liquid in the vial which we have taken from the cellar, and placed in the window, doing the like. But how overwhelming to our finite intellect are the power and the knowledge which, by one simple agent, and one simple law, could regulate alike the production of a world, or of a grain of salt! Would the devout man ever again part with such an anchor of faith as this, when once his understanding has found its use?—The events of this world may look dark, but has not He, who from its very foundation, so regulated all things by His first fiat, that not an atom of the mass, in all its countless changes, is ever lost, or ever useless—so regulated also the moral order of His creation, that “all things,” as the sacred text expresses it, “work together for good to those that love Him?”

It is in the enlarged views which science gives, that we first learn duly to appreciate the Deity. Eternity, infinity, omnipotence, are attributes so astounding to human faculties, that we can only arrive at the most moderate apprehension of them by steps;—Jacob’s ladder must stand upon the earth in order to reach to heaven.—What more worthy employment, then, can man find for the faculties God has so richly bestowed upon him, than the investigation of those hidden forces which tell, in so plain a language, of the Mighty Power which called them into action? Before such knowledge superstition necessarily fades, like darkness before the sun,



and more worthy notions of the Deity, and of man's business upon earth, must necessarily be formed. We may safely aver that no chemist and astrologist of the present age could be an idolater. Let us not then underrate the value of science; let us not suppose that it is merely good for the navigating of the ocean, or for giving impulse to a steam-engine, or permanence to a dye; all this it may do, but it does much more—while it improves our bodily comforts, it also elevates the mind to a state of more spiritualized feeling;—teaches us to despise the low pleasures of earth; and to strain forwards towards that higher meed which is alone worthy the aspirations of a human soul; and whilst shedding blessings around us in this present world gently leads us on to a better.

THE END.

**SMALL BOOKS ON GREAT SUBJECTS.**

**EDITED BY A**

**FEW WELL-WISHERS TO KNOWLEDGE.**

**No. V.**

O vitæ philosophia dux! O virtutis indagatrix, expultrixque vitiorum! quid non modo nos, sed omnino vita hominum sine te esse potuisset? Tu urbes peperisti; tu dissipatos homines in societatem vitæ convocasti: tu eos inter se primò domiciliis, deinde conjugiiis, tum literarum et vocum communione junxisti: tu inventrix legum, tu magistra morum et disciplinæ fuisti. Ad te confugimus: a te opem petimus; tibi nos, ut antea magna ex parte, sic nunc penitus tososque tradimus. Est autem unus dies bene et ex preceptis tuis actus, peccanti immortalitati antepo-  
nendus. Cujus igitur potius poibus utamur, quam tuis? quæ et vitæ tranquillitatem largita nobis es, et terrorem morti sustulisti.  
*Cic. Tusc. Quæst. lib. v. c. 2.*

A BRIEF VIEW  
OF  
GREEK PHILOSOPHY  
UP TO THE  
AGE OF PERICLES.

*by*  
*Caroline Frances Cornwallis*

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## INTRODUCTION.

NEARLY three years ago a small volume crept into print entitled "Philosophical Theories and Philosophical Experience by a Pariah." It purported to be, and was, the result of deep communings with unseen things which suffering had produced in one who believed in a God, and as a consequence of that faith believed that in whatever he *permitted* even, there must be latent good; and, therefore, resolved to seek, and hoped to find it. At that time two only were privy to the publication; the Thinker, and the Friend who edited those thoughts because they were his own also; and who, possessing the sinews of—printing—determined that they should no longer form the mere private solace of one or two.

An unexpected success attended the experiment: the philosophy propounded was approved; its applicability to all the great purposes of life was acknowledged; and, very shortly after, a society was formed for the purpose of editing more works of the same kind; in which sound views of science, and great philosophical principles should be clearly and shortly brought forward, for the benefit of those who had neither time nor inclination to seek them in more voluminous works. Since that time three more tracts have been ushered into the world under the auspices of this society:—the Theories have gained publicity in the lecture room of the Royal Institution, and have found favor in the sight both of philosophers and divines. Physiologists of no mean fame have listened and praised; and among those whom our age looks up

to as great in science, many have bestowed so liberal a share of commendation as to outgo the most sanguine hopes of the friends who first associated themselves for a purpose which they thought a good one, but of whose success they were uncertain.

This state of things has put an end to the dual existence of the Pariah, and the Theorist is now but one among many pledged to contribute to the common stock: and he knows not how he can do so better than by presenting as his quota, a short view of a subject which has hitherto slumbered in ponderous folios and quartos, or in fearful ranges of octavo volumes clad in one livery, which put a man's reading courage to the test, and justify him in calling himself bold, who takes down the first volume. Horace's warning of the danger that whilst avoiding the Scylla, lengthiness, we may full into the Charybdis, obscurity, will doubtless occur to the *ungentle* reader, for times have changed since worthy authors addressed their intended victims as *gentle*,—the Theorist can only answer to the thought, that he hopes to steer his barque safely between the two. If, furthermore, any of these *ungentle* personages should wonder why so old a subject as Greek philosophy should be brought forward; he answers, that though we owe the chief of our scientific acquirements to the spirit of inquiry which the literature of Greece awoke, when Europe was slumbering in contented darkness; few are aware of how much that literature has done for us: and he wishes to lead his countrymen, and countrywomen too, to do it more justice. The simple monk who complained of the Greek tongue, and especially of "the book called the New Testament," in that language, as a "pestilent invention;"—and the military despot who forbade it to be taught in his schools, knew it better than we do: they

feared it; for it is the language of the free man, whose mind brooks shackles as ill as his body. We who have drunk at its pure fountain go on our way refreshed, but ungratefully forget whence we obtained the invigorating draught; and too often imagine that we exalt Christianity by detracting from the merits of the great men of antiquity, "who having not the law, were a law unto themselves;" and who, if the sun of the Gospel had not yet risen upon the earth, at least pointed to its dawning. Clement of Alexandria, whom we must allow to have been a competent judge of such matters, explicitly says, "Philosophy was needful to the Greeks before the coming of the Lord, for the purifying of their lives,\* and even now it is useful to piety; being a kind of rudimentary teaching for those who upon conviction receive the faith." "For," he adds a little further on, "philosophy to the Greeks, was what the law was to the Hebrews, a schoolmaster to bring men to Christ."†

It is strange that with such testimony before us, and with many of the works of that age in our hands also, we should have been so generally led astray by a misunderstood passage or two in the epistles of St. Paul, where he is referring to sophists, and not to philosophers; and no less grievous is it, than strange; for such misunderstandings make the first steps in ancient lore a dangerous trial. It is a fearful moment when we discover that any part of what we have been taught in our childhood by those we most venerate, is *not true*:—the very foundation of our best hopes is shaken, and it is well if in that frightful wrench of our reason from our affections, we remain calm enough to examine how much we must forego,

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\* εις δικαιοσυνην.

† Clem. Alex. Strom., lib. i. c. 5.



how much retain. Could we know the private history of most "free-thinkers," as they termed themselves,—“infidels,” as they have been termed by others,—we should most probably find that the greater number,—as we know has been the case with many,—were made what they were by some such revulsion of feeling as that above described. It is time then that the possibility of any such lamentable results should be prevented, by putting into the hands of all, the means of knowing, and consequently of teaching, the unadulterated TRUTH. The child might thus receive from his mother in his infancy, the rudiments of the knowledge which his after progress must be grounded upon; and thus the best years of his life would not be wasted in *unlearning*, when that process is most dangerous, and when there is much hazard that, along with the prejudices of the nursery, the great truths of religion and morality may also be discarded. Science, divine and human, would then stand before him in loving companionship: and what advance would be too great for one whose nature was indeed become what Plato had dreamed long ago;—a blessed harmony of the seen and the unseen, the intellectual and the corporeal. The age of pious frauds and political humbug is passing away: men, and women too, are beginning to be weary of receiving dogmata upon trust: and if there be, as assuredly there is in this age, much of crude and wild theory, and of contempt for what had before been held in honor, let us at least impute it to its right cause, and meet the evil with its proper remedy. The human soul asks for THE TRUTH: let us give it;—for surely that GOD who made man for himself, and who is TRUTH, has made that the road to peace and to happiness.

It may be needful here to premise that in order to

compress matter that usually has filled large volumes into so small a space, it has been requisite to omit all the arguments by which the writer has been influenced to choose one account rather than another, where there were conflicting statements. It is the business of an author who writes a compendium of this kind, to exert his own best judgment in the choice of his materials, in order to give the reader a clear notion of the subject he has undertaken to explain; not to weary him by contrasting the discrepancies between ancient authors, and by detailing the reasons why one witness is more credible than another. In many instances the choice of testimony must be founded on a deep study of human nature generally; a subject too large to be here discussed: the writer, therefore, can do no more than ask his reader to have candor enough to believe that he has left no author unexplored that could throw light upon the subject. The results of his reading, his experience in the world, and his contemplations in solitude, are here given, and he conscientiously believes in their general truth; but his judgment, like that of others, is fallible; and those who have the time, will always do well to examine and judge for themselves.

## CHRONOLOGICAL TABLE.

B. C.	1800	About this time the Israelitish family settle in Egypt, and Greece is peopled by a tribe from Asia, called by the ancient writers, Pelasgi. Argos and Sicyon were the first kingdoms, known as such, in the region thus colonized. The ancient walls and monuments, called Cyclopean, being found where the Pelasgi are said to have settled, were probably their work. Another tribe, the Hellenes, though the weaker of the two at first, gradually gain the
	1550	supremacy. They first appear in Phocis, and about Parnassus, under their king Deucalion, spread into Thessaly, and drive out the Pelasgi. The Hellenes consisted of four tribes, Æolians, Ionians, Dorians, and Achaians. The Israelites leave Egypt. Cecrops leads a colony from Sais in Egypt, to Attica; and Cadmus from Phœnicia to Bœotia.
	1500	Danaus arrives in Argos from Egypt, and persuades the people to depose their monarch, and receive him in his room. Rameses the Great, or Sesostris, pursues his conquests.
	1400	Pelops comes from Mysia to Argos. Minos reigns in Crete, and clears the sea of pirates.
	1250	The Argonautic voyage to Colchis. Orpheus flourished about this time.
	1225	The seven chiefs besiege Thebes; but it is only taken
	1215	by their sons in a second attempt.
	1194—	} Trojan war.
	1184	}
	1180	The descendants of Hercules endeavor to recover their father's kingdom by the aid of the Dorians and Ætoliens: but the first attempt under Hyllus, the son of Hercules, fails. The grandsons of Hyllus, Telephus, and Cresphontes, with Eurysthenes and
	1100	

- B. C.** | Procles (the sons of the third brother Aristodemus) succeed in their enterprise. During this time the *Ætoli*ans plant colonies, about 1124 **B. C.** on the coast of Mysia and Caria, and in the island of Lesbos.
- By the successful invasion of the *Heraclidæ*, Argos, Sparta, Messenia, and Corinth, became Doric; the *Achaïans* being driven out. Elis fell to the *Ætoli*ans, the allies of the Dorians. The *Achaïans* fell back on the *Ionians*, and settled themselves in the part afterwards called *Achaïa*. The *Ionians* were received by the *Athenians*, who were of the same race.
- Sparta during the time it was peopled by the *Achaïans*, was first governed by the princes of the house of *Perseus*; and then, in consequence of marriage, by *Menelaus*, of the house of *Pelops*: but under the Dorians it fell to the lot of *Procles* and *Eurysthenes*, whose descendants continued to share the sovereign power; a king being chosen from each family. *Agis* was the son and successor of *Eurysthenes*, and the two families were hence called *Proclidæ* and *Agidæ*. The distinction between *Lacedæmonians* and *Spartans* took its rise probably from this conquest: the former were the *Achaïan* cultivators, the latter the *Dorian* victors.
- The *Israelites* ask a king, and *Saul* is chosen.
- 1068 | *Codrus* saves Athens by his voluntary death when the Dorians threatened that state. The *Archons* for life who succeed him, continue from 1068–752.
- The *Ionians*, under *Neleus*, the son of *Codrus*, settle in that part of *Asia Minor* afterwards called *Ionia*, and in the islands of *Samos* and *Chios*.
- Lycurgus* gives laws to Sparta, and introduced *Homer's* poems to notice.
- 783- | Spartan wars with *Tegea* and *Argos*, and affairs with  
743 | *Messenia*.
- 754 | Rome founded.
- 752 | *Archons* of Athens limited to ten years magistracy, but still chosen from the family of *Codrus*.
- 742- | First *Messenian* war, ended by the taking of *Ithome*,  
722 | and the voluntary death of the *Messenian* king *Aristodemus*. The *Messenians* become tributary to Sparta, giving the produce of their land to the

B. C.	victors. During this war the college of Ephors was established. Shalmanesar, king of Assyria, carries the ten tribes of Israel into captivity.
689	Gyges, king of Lydia. Flourishing state of the Ionian cities.
682	The ten years archonship abolished in Athens and yearly archons substituted. Aristomenes begins a struggle with Sparta for the recovery of Messenian independence. He is foiled, and Eira is taken, and the Messenians reduced to the condition of Helots.
668	
679	Numa Pompilius, king of Rome.
650	About this period Ardyes, king of Lydia, conquers Priene in Ionia.
640	Thales born.
622	Draco, archon of Athens, publishes his code. Josiah finds the book of the law and enforces its observance.

B.C.	OLYMP.	
610	XLII. 3	Anaximander born?
598	XLV. 3	Cylon endeavors to seize on the sovereign power at Athens. Jeremiah prophesied about this time. The expiation for the murder of Cylon's adherents made by Epimenides. Solon chosen archon with a charge to revise the laws.
568	LIII. 1	Anaximenes born?
561	LIV. 4	Tyranny of Peisistratus in Athens. Cyrus, king of Persia, ascends the throne of the Medes also.
560	LV. 1	Peisistratus is driven out.
557	— 4	Sardis taken by Cyrus, Cræsus, the king of Lydia, made prisoner, and the kingdom of Lydia added to the Persian dominions.
556	LVI. 1	Peisistratus, having allied himself by marriage with the family of Megacles, is elevated a second time to the tyranny.
552	LVII. 1	He is driven out a second time by Megacles.

B.C.	OLYMP.	
548	LVIII. 1	Death of Thales.
540	LX. 1	Phocæa besieged by the troops of Cyrus ; the inhabitants ask a truce to deliberate respecting capitulation, and in the interim embark on board their fleet, and abandon the city. They found Elea or Velia in Magna Græcia, and Massilia in Gaul, besides some settlements in Corsica. Pythagoras establishes his school of philosophy in Crotona.
538	— 3	Third elevation of Peisistratus to the tyranny. He reigns till his death.
536	LXI. 1	Cyrus restores the Jews to their country.
528	LXIII. 1	Death of Peisistratus.
514	LXVI. 3	Hipparchus, the son of Peisistratus, slain by Harmodius and Aristogeiton ; consequent real tyranny of Hippias : return of the Alcæonidæ, and banishment of Hippias. Cleisthenes, the son of Megacles, augments the number of the council from 400 to 500, and divides the tribes anew, making ten instead of four.
500	LXX. 1	The revolt of the Ionian states. Anaxagoras born.
496	LXXI. 1	Miletus taken by the Persians.
490	LXXII. 3	Battle of Marathon.
486	LXXIII. 3	Aristeides banished from Athens by ostracism.
480	LXXV. 1	Heroic death of Leonidas and his companions at Thermopylæ 6th July. Battle of Salamis 25th September. Anaxagoras comes to Athens this year? aged 20 years.
479	LXXV. 2	Battles of Platæa and Mycale 25th September.
478	— 3	Repeal of the law of Solon by which the Thetes were excluded from the government.
477	— 4	The long walls to Piræus built.
469	LXXVIII. 4	Socrates born. Themistocles banished by ostracism this year or the following.

B.C.	OLYMP.	
468	LXXVIII. 1	Cimon's victories over the Persians.
466	LXXVIII. 3	Themistocles condemned—flies to Persia.
465	— 4	Great earthquake at Sparta, and insurrection of the Helots.
461	LXXIX. 4	Cimon banished by ostracism. Parmenides flourished about this time, and Zeno Eleates his scholar, who was 25 years his junior.
456	LXXXI. 1	Callias archon. Anaxagoras, then 44, comes to Athens a second time ?
451	—	The Decemvirs established at Rome written laws, drawn up by them from those of Athens.
449	LXXXII. 4	Death of Cimon.
446	LXXXIII. 3	Pericles makes a thirty years truce with the Lacedæmonians. Public accusation of Anaxagoras, Aspasia and Pheidias. Anaxagoras is banished.
444	LXXXIV. 1	Thucydides, the son of Melesias, Pericles' political rival, banished by ostracism.
441	LXXXVII. 2	Melissus, the pupil of Parmenides, defends Samos ineffectually against the Athenians.
431	LXXXVII. 2	Outbreak of the Peloponnesian war.
430	— 3	Plato born.
429	— 4	Death of Pericles.
428	LXXXVIII. 1	Death of Anaxagoras.

## I.

### GREECE IN A SEMI-BARBAROUS STATE.

FROM 1800 B. C. TO 1044 B. C.

ABOUT eighteen hundred years before the Christian era, a barbarous horde, under the guidance of a chief named Inachus, migrated from the coast of Asia Minor to the islands and coasts opposite; which, previous to that time, if we may judge from the exploits which the traditional stories of this people assigned to their heroes,\* had been the haunts of wild beasts, which found shelter among rocks and forests as yet untrodden by the foot of man. We are not told the cause of this migration: but as we find indubitable monuments of two great empires, even at that early period, the one in Egypt and the other in India—we may perhaps add another also, bordering on the Euphrates,—it is not unreasonable to conclude that what we have seen occurring, even in our own days in North America, may have happened in this case also. The increasing force and population of a civilized people pressed upon the uncivilized tribes around: and voluntarily, or otherwise, the latter left the more fertile lands to their stronger competitors, and retreated to wilder hunting grounds. It was thus, probably, that the whole of Europe became peopled: the pressure from behind drove the more

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\* Hercules, Theseus, and others are celebrated most especially as destroyers of wild beasts. Even Apollo is chiefly famed as an expert archer, and one of his main exploits was the destruction of an enormous serpent.



barbarous tribes farther and farther north, till its most inhospitable regions were at last inhabited; for among the scanty records of our Teutonic ancestors even, we find the tradition of a chief\* with his followers arriving from Asia.

At least a century was spent by the Pelasgi in a state of the wildest barbarism; ignorant, if we may credit their own traditions, of the commonest arts of life, and wandering over the country with no settled habitation: but by degrees they associated into states, and Sicyon and Argos appear to have been under the government of their respective chiefs before 1500 B. C. Pressed on again by other tribes, the Pelasgi passed over into Italy, into Crete, and into the adjoining islands; and the four Hellenic families, the Dorians, the Achæians, the Æolians, and the Ionians, spread over the lands they retired from. Colonies, too, from the more civilized countries, from Egypt, from Phœnicia, and from Mysia, fixed themselves in different parts; and, probably, like other colonists settling among a rude people, carried with them the arts of war as well as of peace, and either by force or persuasion subjugated those whom they found in possession of the country. Cecrops, an Egyptian from Sais, is said to have founded Athens about four generations after the migration of Inachus; and Cadmus, a Phœnician, not far from that time, founded Thebes in Bœotia. About 1500 B. C. Danaus, another Egyptian, arrived in Argos, but here he found a monarchy established, and a walled town. He was allowed to bring forward his claims to admission before an assembly of the people; and they, led

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\* Odin.

† This is the name given by Greek writers to the first inhabitants or rather colonizers of the country.

by what they considered an omen sent by the gods, were induced to depose the reigning monarch, and receive Danaus in his room.\* We cannot tell what the arguments were which the Egyptian prince employed in pleading before the people: we may conjecture that the benefits of superior science were urged, since we find it recorded that Argos having previously been without water, save what fell from the heavens, the daughters of their new king taught the inhabitants the art of digging wells. Four of these wells were in after times held sacred, and received especial honors.† We may guess at the revolution in manners caused by the administration of this monarch, from the circumstance that the appellation of the people was changed from Pelasgi to Danai; a term which we find very frequently applied by Homer to all the Greeks assembled before Ilium.

The situation of Greece, with its numerous islands, soon led the people to undertake maritime and piratical expeditions. That of the Argonauts, from the mythological grandeur with which it has been so carefully invested, would appear to have been either the first or the most important. But in those times, the pirate, like the Sea Kings of the Norwegians, was a gentleman; and no discredit, as Thucydides informs us,‡ was attached to this mode of conveying away the property of others. The marauding expedition of Jason took place, probably, about 1250 B. C. It was during the times of the Judges of Israel; a period when the law of *meum* and *tuum* appears to have been very obscure all over the world.

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\* Pausan. l. ii. c. 19, and Eurip. Orest.

† Strabo, lib. viii.

‡ Thucyd. lib. i.

Most chronologers place the Trojan war, celebrated in the Iliad, about 1200 B. C.\* At that time the Achaian states, for so Homer terms them, were rude, but yet raised far beyond absolute barbarism. We find bards celebrating the exploits of their heroes; Sidonian workmanship adorning their vases, and their robes; and a kind of rough luxury in the courts of their princes, which reminds us of the state of Mexico or Peru, when discovered by Cortez and Pizarro. It matters not whether we consider the Homeric poems as the work of one man, or the lays of different bards collected; still they must be valid evidence of the state of manners about that time, for their geographical correctness shows that they could not have been written any long time after the events took place. In these early ages no maps or books of travels furnished the romancist with the means of giving verisimilitude to his tale; therefore geographical precision could only have been attained by personal knowledge, or the narration of actors in the scenes recorded.

About a hundred years after this, an event occurred which for a time threatened to overcloud the dawning civilization of Achaia. This was the irruption of the Dorians, a mountain tribe, who preserved in their fastnesses much of the rudeness of their forefathers. They were invited to this invasion of the more civilized regions by the descendants of Hercules, who having been expelled by Eurystheus from the countries which they considered theirs by right of inheritance or conquest, took advantage probably of the weakness and disunion among the Achaian states, which followed upon the Trojan war, to urge their claims anew. A first but unsuccessful

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\* From 1194 to 1184 B. C., Heeren.

attempt had been made under the guidance of Hylus, the son of Hercules, about 1180 B. C.; his descendants, having leagued with the Ætolians also, finally triumphed. Argos, Sparta, Messenia, and Corinth, fell under the Dorian rule:\* the Achæians, driven step by step from their country, fell back upon the Ionians, who occupied the coast nearest to Asia; and they in their turn, driven on before the advancing tide of invasion, retreated upon Attica, where they were hospitably received by the Athenians, who sprang from the same stock. But the narrow territory of Attica could not long maintain so large an increase of population, and in 1044 B. C. Androclus and Neleus, the sons of that Codrus who by his self-devotion had saved Athens from Dorian conquest, led an Ionian colony back to the coast of Asia Minor: cities were founded,† and the province thus taken possession of, received thenceforth the name of Ionia. The islands of Samos and Chios

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\* Probably the dissensions between the aristocratic and popular factions in after times, had the character of a war of caste. The conquering Dorians had usurped the property in the soil; the conquered Achæians were the cultivators, for them, of lands which were once their own. Thus it was in Lacedæmon where the Spartans, i. e., the Dorian conquerors, remained a distinct people from the Lacedæmonian cultivators, who, again, were a step above their former slaves, the Helots, and those who were afterwards reduced to a state of slavery. The contests for political supremacy between the patricians and plebeians of Rome, were probably of the same kind, for the very names of the plebeian consuls sound barbarous and strange among those of the patrician families, as if they were of a different race. We may see a modern illustration of this state of things in Ireland, where the conquered and the conquering people have failed to amalgamate.

† There were ten Ionian cities, i. e., Phocæa, Erythræ, Clazomene, Teos, Lebedus, Colophon, Ephesus, Priene, Myus, and Miletus. The latter was the nurse of that philosophy which afterwards made Athens famous.

too, the latter said to have been the residence of Homer, received Ionian colonies.

Thus the civilization which was checked for a time by the conquests of the Dorian hordes, was preserved in the cities of Ionia, and sent back its missionaries, after a time, to achieve a nobler victory—that of arts and philosophy over ignorance and barbarism. From this period the people of Greece may be considered as divided into two great families, the Ionian and the Dorian, in which the others were in great measure absorbed. The Athenians may be looked upon as the representatives of the first; the Spartans of the last.

It would be a wearisome and hopeless labor were I to attempt to trace with any accuracy the theology or philosophy of these early periods, buried as they are under a mass of allegory and fable, which we have now no means of removing; yet in the very scanty records of those times, there are traces of a purer morality, and a more worthy religious belief than is exhibited in the gross mythology of the Homeric poems.\* The date assigned to the migration conducted by Inachus from the Asian shore, coincides very nearly with that of the removal of the Israelitish family into Egypt. At that time the worship prevalent among the Nomade tribes of Asia, if we may judge from the book of Job, seems to have been that of One Almighty Creator, typified by, and already beginning to be confounded with the light,

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\* Herodotus, lib. ii. c. 53, gives it as his opinion that Homer and Hesiod were the *inventors* of the genealogies and names of the gods; and Diogenes Laertius reports that Pythagoras was said to have descended into the infernal regions, and to have there seen Homer and Hesiod suffering various punishments for what they had reported about the gods. Diog. Laert. in vitâ Pythag., lib. viii. § 21.

or sun; the rest of the heavenly bodies sharing in the reverence paid to the apparent source of life. Herodotus states that at Dodona he was told that they had formerly sacrificed and prayed to the Deity in general, without giving any name or names to the object of their worship; but that after a long time, the names of the gods were brought them from Egypt. Plato mentions a tradition of one God governing the universe, though generally in so strangely disguised a form that we may fancy that the fate of his master Socrates inspired him with some fear of speaking too plainly.\* Aristoteles is more explicit, and avers,† that “it was an ancient saying received by all from their ancestors, that all things exist by and through the power of God . . . . who being One was known by many names according to his modes of manifestation.”

The very early division of the more polished nations of India and Egypt into castes, which occasioned a separation of the priesthood from the people, was probably the cause then, as it always has been, of a grosser worship on the part of the latter. The learned sacerdotal caste reserved to itself the more abstruse parts of theology; partly perhaps from a natural desire to keep up the superiority which, however acquired, is always gratifying; and partly, too, from an opinion that the doctrine was too sublime for the comprehension of the ignorant multitude. Then came the plan of teaching the people by symbols which, from their more tangible nature, were likely to impress themselves on the recollection better than abstract truths. The key to these mysterious symbols was in the hands of the priests; and possibly they

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\* Plato, Politicus and Timæus.

† Aristot. de Mundo, c. 6, 7.

themselves hardly knew how far the people in general had lost sight of their original meaning. We may turn to times nearer our own for an almost parallel instance: for when the irruption of barbarians into the Roman empire gave the Christian ministers the superiority in learning, they soon were tempted to use it in the same way. Feigned miracles and a more gross and tangible worship were made use of to subjugate or to captivate the minds of the ignorant people about them; for, finding them too rude to be argued into a better faith, they thought that by first obtaining a superstitious reverence, they might finally guide them to better things.\* They forgot that when they had loaded religion with ceremonial observances, there was danger that even the priests themselves, at some future time, might possibly become infected with the general superstition, and suffer the substance to escape whilst they were grasping the shadow of truth.

Doubtless the sacerdotal caste of Egypt retained for a considerable time the remembrance of the occult meaning of the symbols they used; and supposed they were preserving the knowledge of a theology whose vivifying influence they were daily losing more and more, as it became a source of worldly advantage, till at last they saw in it only a fable which was useful to them.† They, too, had to encounter at

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\* When the pagan Anglo-Saxons were first converted to Christianity, we find Gregory, the Roman bishop, thus writing to the missionaries he had sent into Britain—"And because they (the Saxons) have been used to slaughter many oxen in the sacrifices to devils, some solemnity must be exchanged for them . . . to the end that whilst some gratifications are outwardly permitted them, they may the more readily consent to the inward consolation of the grace of God." Bede's Eccles. Hist., chap. 30.

† The transition from Gregory indulging his heathen converts with solemnities in honor of "the nativities of the holy

times the invasion of barbarians, on whose superstitious fears they might depend for safety : or they had to resist, as a corporation, the encroachment of monarchs upon their privileges, in which contest, again, the superstition of the people was an useful ally. Thus the motives for encouraging a grosser worship were strong ; the danger was remote, and at that time unknown. Few, even now after the experience of ages, seem to be aware that there must be a rational conviction of the truth of our faith ere it will influence the heart and life : and it has been the error of all ages to imagine that it is better to keep the people ignorant, and obedient to guidance, than to give them the light which will enable them to guide themselves. The difficulty of the undertaking has generally been the first discouragement : indolence and the love of power have usually done the rest.

ORPHEUS is the person to whom ancient writers have attributed the introduction of a multitude of gods. He is said to have been a Thracian ;—to have accompanied Jason and the other Argonauts on their piratical expedition,—to have visited Egypt,—and to have brought from thence the doctrines with which he afterwards corrupted the rude but simple theology of Greece. The poems and hymns attributed to him are many of them considered to be spurious, or much interpolated ; but as far as ancient testimony goes, there seems little doubt that the doctrine he taught was that of ONE SELF-EXISTENT

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martyrs, to the end that **THEY** may the more easily consent to the inward consolations of God”—to Leo X. exclaiming,—“ This fable of Jesus Christ has been very useful to us”—is curious and instructive. The step had then been made from the apostolically-minded though ill-judging prelate, to the selfish maintainer of the interests of his caste.



**God**, the Maker of all things, who is present to us in all His works: but this great truth was disguised under a mass of fables.\* We may take as a specimen one of those which has reached us. "The origin of the earth was ocean: when the water subsided, mud remained, and from both of these sprang a living creature;—a dragon having the head of a lion growing from it, and in the midst, the face of God: by name Hercules or Chronos," (time.) By him an immense egg was produced, which being split into two parts, one became the heavens, the other the earth. Heaven and earth mingled, and produced Titans or Giants.†

Material things having been produced by some mysterious operation of the Divinity upon Chaos, all were held to be imbued with a portion of the Divine Essence: and as, according to the doctrine of the sacerdotal caste, the Supreme Deity was too mighty to be approached by the vulgar, every object in nature was, as it were, deified, for the use of the people; and the portion of the Divinity by which it was supposed to be animated, had a peculiar name given to it, by which it might be invoked. The initiated, for the mysteries are said to owe their commencement to Orpheus, were taught that the One Supreme Deity was the source of all, and that the tutelary gods of air, fire, earth, &c., were in fact only emanations of his power, made manifest to men by tangible and visible objects. But when the Most High was no longer to be approached by the vulgar, the especial manifestation was soon individualized, and a polytheism which probably the first intro-

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\* See Cudworth, *Syst. Int.* cap. iv. § 17, and Brucker, *Hist. Crit. Phil.* pars ii. lib. i. cap. 1, where the Orphic doctrines are fully discussed.

† Athenagoras, *Leg. pro Christ.* p. 17, folio ed.

ducers of this mysterious doctrine never contemplated, was built upon it.

It is curious that to this day the rude tribes of Africa and of North America retain something of this early doctrine: the fetiche of the Negro, and the "medicine bag" or amulet of the Red Man, both consist of insignificant objects supposed to have some mysterious, in-dwelling, Divine potency linked to, yet quite distinct in nature from the object visible to the eyes. The fetiche in Africa even now is not unfrequently a stone or a tree, or some other inanimate object; and if we look back into the early times we are treating of, we shall find the same thing. The representation of the Cithæronian Juno, worshiped by the Thespians, was the trunk of a tree:—another of the Samian Juno, was a branch or log, afterwards fashioned into something of a human shape by the order of Procleus the Archon. Diana and Ceres were represented in like manner:\* and the Dioscuri among the old Spartans had no image save two beams or trunks of trees, united by two transverse pieces.† The ancient Romans worshiped the god of war, under the form of a spear; the Scythians deified a sabre; the Arabs, down to the time of Mahommed even, had their sacred stone. We might have been puzzled by these short notices, had we not an instance of this kind of early worship recorded more at length. When the patriarch Jacob had

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\* Clem. Alex. Protrept. c. 4. See also Tertull. adv. Gentes. Lucan, in his description of the sacred grove felled by Cæsar's orders, describes the representations of the Deities as rude trunks of trees.

..... "Simulacraque mœsta deorum  
Arte carent, cæsisque extent informia truncis."  
Pharsal. lib. iii. l. 411.

† Plutarch, De amor. frat.

had a divine vision, he awoke out of his sleep, and said, "How dreadful is this place! this is none other but the house of God, and this is the gate of Heaven." And Jacob arose early in the morning, and took the stone that he had put for a pillow, and set it up for a pillar, and poured oil on the top of it, and vowed, "If God will be with me . . . so that I come again to my father's house in peace, then shall the Lord be my God, and this stone which I have set up for a pillar, shall be God's house; and of all that Thou shalt give me, surely I will give the tenth unto Thee." This place he called Bethel:—some centuries later Bethel was an idolatrous temple. The history of this one was probably the history of all.

The mysterious doctrine of Orpheus which gave tangibility and distinctness to the notions of the Deity, soon struck the imagination of the poet: Homer and Hesiod took it up, and finished the individualizing process, by giving names and forms\* to the various sub-deities of the different powers of nature. Yet these were, for a long time, only the poetical version of the old belief:—the One Supreme God still held the reins, and Destiny was looked up to as the ruler of these sub-gods, no less than of men. Æschylus, whose tragic genius found fitter matter in the simple, but sublime traditions of his forefathers, than in the ridiculous and disgusting tales of the Homeric mythology, has handed down to our days this part of the still popular faith, in his noble drama of Prometheus Chained: where he represents Jupiter as sending to beg from the prophet

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\* Athenagoras, after quoting Herodotus for the above assertion respecting Homer, adds, that until the statuaries had given human shape to the gods, they had not been named even.

the knowledge of the yet future decrees of Destiny. Prometheus, who pretends to no foreknowledge but that of some few of these decrees which had been communicated to him, indignantly refuses to gratify the curiosity of his oppressor; who, in consequence, inflicts further tortures upon him, but cannot obtain the desired prediction. The expressions put into the mouth of Prometheus are remarkable,\* and the whole drama so wars against our general notions of the popular belief at that time, that in order to explain the possibility of such a public recitation being permitted and approved, we must suppose an under-current of a very different theology from that of Hesiod. The invectives which the oppressed Titan utters against the *new* power of Jove; the allusions

\* ΠΡ. οὐ τὰυτα ταύτη μοῖρα πῶ τελεσφόρος  
κρᾶναι πέπρωται . . . . .

τέχνη δ' ἀνάγκης ἀσθενιστέρα μακρᾶ

ΧΘ. τίς οὖν ἀνάγκης ἔστιν οἰακοστέφος;

ΠΡ. Μοῖραι τρίμορφοι, μνήμονές τ' Ἐριννίές

ΧΘ. τούτων ἄρα Ζεὺς ἔστιν ἀσθενίστερος;

ΠΡ. ὅκ οὖν ἂν ἐκφύγοι γὰρ τὴν πεπρωμένην.

PROM. Fate, which brings about its own ends,  
Has not ordained this to be . . .  
Art is much weaker than Destiny.

CHΘ. But who holds the rudder of Destiny?

PROM. The three formed Fates, the ever remembering Avengers.

CHΘ. Is Jupiter weaker than these?

PROM. He cannot escape from what is fated.

The masculine adjective attached to the feminine substantive *Μοῖραι*, shows sufficiently that this poet, at least, had not the three old spinning women in his mind when he wrote the above passage. Aristoteles says in his treatise *περὶ κόσμου*, c. 7. οἶμαι δὲ καὶ τὴν Ἀνάγκην οὐκ ἄλλό τι λέγεσθαι, πλὴν τοῦτον, οἰοῖναι ἀπίκνητον αὐσίαν ὄντα. "I think indeed that Destiny is nothing else but this,—i. e. God—so called from his unchangeableness." This philosopher adds that the three fates meant the past, present, and future.

to wars in which he had himself assisted him, &c., lead us back very naturally to the time of the first colonization of Greece: and we can hardly avoid the conclusion that the Nature-worship of Orpheus had been mixed up with Hero-worship also, and that the Jupiter of the poets was little else than a successful Cretan pirate, who, with his companions, drove out the Asian chief who was beginning to civilize the people, and banished him to the wild regions of the Caucasus. If several centuries had elapsed between Prometheus, supposing such a person to have existed, and Hesiod, it was quite long enough, in times when song was the only record, to have invested conquerors, or benefactors of the human race, with some supernatural attributes; a kind of pre-eminence which every master mind, in times of ignorance, is sure to attain.

The result, then, of the inquiry thus far, appears to be, that the first colonizers of Greece brought with them much of the simple faith and worship which we find recorded in the early Hebrew writings: a stone or a trunk of a tree was set up for a memorial, and the sons of him who had there experienced some deliverance, or been alarmed by some dream, worshiped where their ancestor had done, that Great Being whose rule they acknowledged, but whose name they ventured not to pronounce.\* Superstitious practices doubtless were mingled with this worship: the vow of Jephthah had more than its parallel in the sacrifice of Iphigenia and of Polyxena.† It was this ferocious race that Orpheus,

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\* Plutarch makes it a question why the Romans did not permit the god who especially protected Rome to be named, or made a subject of idle inquiry? Another proof that every nation felt that there was a Most High, whom they regarded with awe.

† These events must all have occurred within thirty years.

the polished and learned traveler, endeavored to humanize. Perhaps he imagined that his hidden doctrine would improve those of a higher rank, who were likely to be initiated; while the minds of the vulgar would be amused by his fables, and weaned from more gloomy superstitions by the worship of Divine Benevolence, as manifested in the different powers of nature. But however well meant the attempt, it failed of its object: the grossness of an ignorant age converted the different manifestations into separate Deities; and as, in later times, the crucifix or the image of the Virgin in some particular church was held to be more efficacious than any other, and to have some especial virtue of its own; so some particular representation or memorial of the Divine power was deemed more wonder-working than another, and different cities came to have their tutelary stone, or log, or finally,—statue. The temple was built on the spot which early and pure devotion had hallowed, as was the case at Bethel: the men of the age when it was erected saw only the honor done to the place where their earliest feelings of piety had been awakened; and it was only in times far subsequent, that the cause of its first consecration was forgotten, and the image which reposed in that gorgeous fane became the object of ignorant worship, and the source of profit to a mercenary priesthood.

## II.

### GREECE UNDER ITS SAGES.

FROM 1041 B. C. TO 512 B. C.

WE have already taken a slight view of the fortunes of the early colonizers of Hellas up to the invasion of the Dorian hordes,\* whose conquests drove the more civilized inhabitants forward towards the coast, and the territory of Attica, whence they re-colonized Asia Minor, and founded the cities of Ionia. From that time during a period of nearly three hundred years, tradition scarcely furnishes an event save the extensive colonization of the islands and coasts adjacent, by Æolians, and Dorians, as well as Ionians, a silent proof of the increasing population, and maritime enterprise, of the different states. The death of Codrus, the Athenian ruler, had left room for a contest as to the succession to the throne; and during the disputes of the two competitors, a third party had arisen, which refused to allow any other king than Jupiter.† The elder son of Codrus obtained the sanction of the Delphian oracle, and the democratic party were conciliated by what was ostensibly a compliment to Codrus. No one was worthy to bear the same title with this heroic monarch; his son therefore was only allowed the title of Archon, accompanied with some limitation of the regal power. His descendants continued to enjoy

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\* This event is sometimes called "The return of the Heraklidæ."

† Schol. Aristoph. Nub. quoted by Mitford in his Hist. of Greece.

this rank till 752 B. C. when, without any assigned cause, the archonship was rendered a magistracy of ten years duration only, though still confined to the family of Codrus. History says nothing, but we may reasonably conclude, from such an event, that the great families were becoming powerful: that acts of oppression had been committed by the hereditary archons, which had alienated the affections of the commonalty, and that the nobility, by their aid, effected a revolution which put the main power of the state into their own hands; for as the selection of archon was henceforward vested in them, he became little better than their puppet. After a lapse of seventy years, during which, as before, no event is noted, a farther change was made in the government: the Archonship for ten years was abolished; the office was now to be held for one year only, and its power was divided among nine persons, who were chosen by lot from among the nobility. This farther change was followed, as might be expected, by contests among the principal families for the power now within their reach, and attempts to seize upon the sovereignty.

During this time Sparta was engaged in a twenty years war with Messenia,\* and its events may give some notion of the manners of the times. It took place about the time when the ten tribes of Israel were carried into captivity by Shalmaneser, King of Assyria, and a little after the foundation of Rome. We find the King of Messenia encouraging his men to a desperate resistance, by depicting the miseries which would attend a defeat: their wives and children would be carried into hopeless slavery, their temples would be plundered and burnt, and their

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\* From 742—722 B. C.



country desolated.\* When defeated, they apply to the oracle at Delphi, and receive a command to sacrifice a virgin of the blood of Epytus to the infernal deities; whereupon Aristodemus, a nobleman of that family, proffers his own daughter as a sacrifice, whom he afterwards slays with his own hands,† and dissects, in order to show that she had not been contaminated, as had been asserted, in order to save her life.

The war ended by reducing the Messenians to the condition of farmers of their own lands for the benefit of Sparta; a state of things not likely to be long brooked by a high-spirited, and, till then, independent people: the same year which was signalized by the change in the Athenian government to annual Archons, was marked also by the beginning of a second Messenian war, in which the gallant Aristomenes strove to free his countrymen from their bondage. The Spartans, alarmed by his exploits, consulted the Delphian oracle, and received for answer that they should seek a counselor from Athens; but the Athenians, when called upon to comply with the commands of the god, unwilling to aid the growing strength of Sparta, picked out a person they thought little likely to be useful; the lame Tyrtaeus,—hitherto known only as a teacher of grammar, which, in those times, when prose writing was little practised, included the art of poetry, and probably of rhetoric. Athens, it seems, had not yet been taught the power of words over the mind:—the Messenians learnt it to their cost:—the songs of Tyrtaeus, worthy of a better cause, inspirited the defeated Spartans, and

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\* Pausan. lib. iv. c. 7.

† About fifty years before this, the King of Moab in like manner, when defeated, offered his own son and heir for a burnt offering. See 2 Kings iii. 27.

the sword of Aristomenes proved weak against the might of poesy: Messenia again lay at the feet of her ruthless conquerors, and they used their advantage barbarously: the Helots of after times, who were periodically hunted down like wild beasts, were chiefly Messenians.

The change of government in Athens, had either been caused by, or was attended with great popular disorders. Notwithstanding the severe code of laws promulgated by Draco, during his archonship, the great families still engaged in bloody dissensions; and about 598 B. C. Cylon, a man of noble, though not regal descent, seized on the citadel, and endeavored to make himself sole ruler: Megacles, then archon, and of the family of Codrus, opposed him; after a short struggle he fled, and his adherents took sanctuary at the most sacred of all the altars of Athens, that of the Eumenides, or avengers. They were lured from thence by treachery, and massacred; a sacrilege which was for a long time urged as a cause for banishing all connections of the family engaged in it.

Wearied at last by civil broils, and the revolts of subject states consequent upon them, all eyes in Athens were turned upon one man, as the only person capable of reforming the state. SOLON was made archon, with full power to re-model the constitution. After promulgating his laws,\* he proceeded to travel in other countries, and in his absence Peisistratus possessed himself, by a stratagem, of the sovereignty. Notwithstanding the mode of attaining it, both he and his sons used their power well: the

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\* 594 B. C. They will be found at length in Mitford's History of Greece, chap. v. sect. 4, or more briefly in Heeren's Handbuch der Geschichte der Staaten des Alterthums, part iii. § 14, a work of extraordinary merit.

laws of Solon were maintained; Athens was beautified; means were taken for humanizing the citizens by the introduction of the fine arts; charitable provision was made for orphans, for the infirm and aged; and in the absence of books, moral sentences were inscribed in conspicuous places: \* the state was respected abroad, and enjoyed peace at home. This state of things was changed by the assassination of Hipparchus, the younger of Peisistratus's two sons, in consequence of a private pique.† Hippias the elder brother, equally incensed and alarmed, began to seek foreign alliances for his family, and to rule with great severity at home, which soon disgusted the people; the banished family of Megacles returned, and, with the aid of the Spartans, and the now discontented Athenians, expelled him. Cleisthenes, the son of Megacles, assumed the chief rule, and the first innovation in the laws of Solon was made by increasing the number of tribes from four to ten, and that of the great council from four hundred to five

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\* "These tyrants," says Thucydides, dwelling mockingly on the word applied to them by Athenian tradition, "These tyrants greatly cultivated wisdom and virtue." Thucyd. lib. vi. The poor-law above mentioned, was extended to all who by mutilation, sickness, or age, were incapable of maintaining themselves; and amounted to from one to two oboli per diem, which was sufficient to purchase the necessaries of life: orphans were maintained and educated at the expense of the state, up to the age of eighteen, when they were armed and placed in the army. See Boeckh's Public Economy of Athens.

† The conspiracy of Harmodius and Aristogeiton, though hymned by the Athenians of after times as the struggle of free men against tyranny, is said by the dispassionate Thucydides to have originated in motives as impure as the execution of their plan, if it had been merely for the overthrow of the tyranny, was unsuccessful. But the hated rival was destroyed, which, probably, was the chief consideration. The attempt was no less unpopular than unsuccessful, for Aristogeiton, who escaped the guards, was seized by the people, and most unmercifully handled.

hundred. But though the change probably had in view the giving a somewhat more popular form to the government, or at least the curbing the power of the adherents of the banished family, no single ruler could be brooked: Cleisthenes and his Spartan allies were forcibly opposed and defeated, and the aristodemocratic form of government in Athens was confirmed.

The period which has just been slightly glanced over was fertile in great men. The power which mental cultivation affords to its possessor was for the most part nobly used; and few purer or more disinterested philanthropists are to be found than the lawgivers and sages of this period, whose names have been handed down to us by the gratitude of their fellow-citizens. The names of Zaleucus, Charondas, Lycurgus, and Solon, are still famous as having been able legislators; and if they failed to produce a perfect code, we may admit for them all, the excuse which Solon made for himself, when asked if he had given the Athenians the best possible laws, according to his own opinion. The sage replied that he had not; but that he had given them the best they were capable of receiving.\* From Moses downwards this has probably been the case, for the attempt to cut down prejudices all at once, and to change the whole customs and manners of a nation, would but end in the destruction of the imprudent innovator, without improving the people; unless, as in the case of Christianity, the system was supported by superhuman means.

The custom of Greece gave the title of Σοφός, or sage, to those who excelled their fellows in science, or moral worth. It is fabled, or perhaps the tale

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\* Plutarch in *Vitâ Solonis*.

may be a fact, that a golden tripod having been drawn up in their nets by some fishermen of Miletus, a quarrel arose as to its possession. The oracle at Delphi was consulted, and the dissension was allayed by its award of the tripod "to the wisest." The Milesians, by common consent, then offered it to their countryman Thales, who, with a laudable modesty, sent it on to Bias of Priene, who transferred it to Pittacus, and Pittacus to another yet, till it came seventhly to Solon, who finding no other mortal worthy of it, dedicated it to Apollo, as the only wise.\*

The names of the seven among whom the tripod thus passed round, are differently given by different authors. THALES is, however, always placed at the head of them. He was a native of Miletus, in that Ionia where Grecian civilization had sought an asylum from Dorian barbarism; and he is looked up to as the founder of the Ionic school of philosophy, so fruitful in great men; and which closed its bright career by imbuing with its doctrines the son of a stone-cutter, who, in spite of humble birth and poverty, won for himself the most illustrious name in all antiquity; and whose purity of doctrine, and holiness of life, wrung from Erasmus the acknowledgment, that when he perused the life of this heathen, he felt tempted to exclaim, "Sancte Socrates! ora pro nobis!"

At an earlier period legislation and political science had alone attracted the notice of the sage; but attention was now turned to the natural sciences also. "Thales, the Milesian," says Cicero, "who was the first who made such things a subject of inquiry, said that water was the origin of all things; but God the

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\* See Brucker, *Hist. Crit. Phil.* p. ii. lib. i. c. 2.

mind which formed all things from it.”\* There is in this a striking parallelism to the history of creation given by Moses, scarcely to be accounted for, unless we suppose his opinions on this head derived from tradition. Thales had visited Egypt: he was somewhat junior to the Prophet Isaiah, and such an event as the destruction of Sennacherib’s army could not but have made a strong impression on surrounding nations. The sage, traveling for information, could therefore scarcely avoid the having his attention drawn to the Hebrew records; which is made the more probable from an expression which Plato puts into the mouth of Socrates; that, for the higher doctrines of theology, his disciples must go to the barbarians.† The other opinions of Thales, as far as we have them recorded, are these—“God is the eldest of all things, for he is without beginning.‡ Death differs not from life, the soul being immortal,”—as a consequence of which, he believed the universe to be full of the disembodied souls of good and bad men, called by the Greeks *dæmons*. When asked “if a bad man could hide his evil actions from the Divine power?” “Not even his evil thoughts,” he replied; and when farther questioned, “how to lead an honorable and a just life?” he answered, “By not doing ourselves what we blame in others.” When asked “what is fairest?” he replied, “The world, for it is the work of God.”§

Thales is said to have had no teacher but the priests of Egypt; under their tuition, and by his own industry, however, he made considerable progress in geometry and astronomy. He is said to have sacri-

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\* Cicero de Nat. Deor l. i. c. 10.

† Plato Dial. Phædon.

§ Diog. Laert. lib. i. § 35, 36, 37.

‡ ἀθάνατος.

fixed an ox in thankfulness for the discovery that a right angled triangle could be inscribed in half a circle; and to have measured the pyramids, by comparing the length of the shadow with his own. In astronomy his opinions probably were clearer than his reporters make them. His first assertion that night preceded the day, is again in conformity with the Hebrew account; he is farther said to have considered the stars and moon to be of terrestrial substance, the former ignited, the latter giving light by reflection from the sun. His disciples are said to have taught that the earth was in the centre of the system;\* but as that doctrine is elsewhere stated to have been first broached by Parmenides,† it is probable that Thales himself did not teach this. He is recorded to have predicted a total eclipse of the sun, which occurred in his time; the first calculated eclipse on record.‡ He considered that all bodies, though almost infinitely divisible, were composed of atoms, i. e. particles incapable of farther division; and in this he was followed by Pythagoras:§ and he was no stranger to the magnetic and electric properties of the loadstone, and of amber. He is said to have considered these substances as endowed with souls;|| yet considering the decline of Grecian literature at the time the accounts which have reached us were written, considering too that the use of the mariner's compass was known, and had been known from time immemorial in some of the countries visit-

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\* Plutarch. de Placitis Phil. l. iii. c. 2.

† Diog. Laert. in vit. Parmen.

‡ Cic. de Divin. l. i. c. 49.

§ Plut. de Placitis Phil. l. i. c. 16.

|| Aristoteles notices this opinion with regard to the loadstone in his treatise *de anima*, arguing from it that Thales must have considered the soul *a force* capable of causing movement, since he attributed a soul to the loadstone. De Anim. lib. i. c. 2.

ed by Vasco de Gama;\* we may give Thales credit for more knowledge on these subjects than either Plutarch or Diogenes Laertius was able to explain; probably as much as we ourselves possessed up to the middle of the last century. Such were the extraordinary strides in knowledge made by one man almost unassisted; we cannot wonder that his countrymen voted him the tripod. He lived to the age of ninety, and died full of years and honor, at the representation of the Olympic games, 540 B. C. Paganism had not then become bigoted to falsehood, as was the case in after times, when the idolatry of the people became a part of the polity of states; and Thales could profess without reproach, what afterwards sent Anaxagoras into banishment, and cost Socrates his life.

EPIMENIDES of Crete has by some been placed among the seven sages of Greece: at any rate he was in habits of intimacy with them. He is, however, more noted as a man of piety and holy life, than as deeply versed in science. He was sent for to Athens after the massacre of Cylon's adherents, to purify the city from the guilt which was supposed to have incurred the wrath of the gods, and occasioned a pestilence. Various lustrations were used by him; among other ceremonies, he ordered a certain number of white and black sheep to be let loose on Mars' hill,† and wherever they lay down, he directed that an altar should be built to the god to whom that spot belonged: but to this god no name was allowed to be given. The order was scrupulously obeyed: seven centuries later, Paul, the apostle, stood upon this spot, pointed to the altar of the unknown God,

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\* See Bailly, Hist. de l'Astronomie.

† Ἀρειώγειος. The court of Areopagus was held here.



and spoke the doctrine boldly, which Epimenides had been too timid to give utterance to, or which perhaps he had but dimly discerned. A painter could not ask a finer subject than the intrepid apostle, laying his hand on that altar, which neither the arms of Xerxes, nor the yet more destructive force of time had injured, raising the other to heaven, and exclaiming to the astonished Athenians, "Whom ye ignorantly worship, him declare I unto you—**THE GOD THAT MADE HEAVEN AND EARTH!**"

Many fabulous stories are told of Epimenides, and it is said that after his death divine honors were awarded him by his admiring countrymen; what is more certain, is, that he declined all the riches offered him by the Athenians, and asked only a free passage home, and their friendship for the Gnessians his townsmen.\*

SOLON, by general consent has been placed among the wise seven. Younger than Thales and Epimenides, he was nevertheless intimate with both, and, like the former, appears to have made considerable proficiency in the natural sciences; for it is said that he corrected the reckoning of the lunar month made by Thales. His fame, however, rests mainly upon his laws, which, according to the state of society they were intended for, were probably wise ones, and as good as could have been promulgated without personal danger. What that state was, we may gather from what remains to us of his code. By his laws all freemen were divided into four ranks, determined by the amount of property. The first rank consisted of those whose land produced them yearly five hundred measures† of corn, wine, oil, or

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\* Diog. Laert. lib. i. § 111.

† Medimni. A medimnus was about 12 gallons.

any other commodity of this kind :—the second rank must possess, in like manner, a yearly revenue of three hundred measures. These two were exempt from service on shipboard, and in the infantry; but they were bound to keep a horse for the service of the public; and, within the age of military service, to serve personally in the cavalry. Hence they had the title of *Hippeis*, Horsemen, or, as the word is often translated, Knights. The third rank, called *Zeugites*, were of persons whose lands produced two hundred measures, but less than three hundred. These were bound to serve in the infantry, among the heavy armed, and to be provided with complete arms for the purpose. The rest of the citizens, not possessed of lands yielding two hundred measures, were comprehended under the name of *Thetes*. These also were bound to military service; and if provided with sufficient armor, might increase the force of the heavy armed; if not, they served among the light armed and on board the fleet.\* The offices of the state could only be filled by those of the three first classes, but all the four had a voice in the election of magistrates, in the decision of criminal cases as jurors—and in the general assembly of the people. The highest court was that of *Areopagus*: it consisted of all those who had passed through the office of *archon* with credit. Next to that was the *senate*, or council, as it is generally called: chosen by lot from the different wards or tribes of *Attica*: at first, when they were four, an hundred from each; afterwards, when *Cleisthenes* divided the country afresh into ten wards, fifty were chosen from each, making up five hundred whose characters were required to be such as would bear a strict scrutiny, which was

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\* *Mitford's Hist. of Greece, Chap. v. Sect. 5.*

instituted previous to their admission: a law which tells of a still simple state of manners. In this council the business was prepared for the general assembly of the people, whose consent was needful to the enactment of any new law. Besides these there were regular courts of judicature, and judges likewise made their circuits through the different districts, to administer the laws without giving plaintiffs the trouble of coming to Athens.

Slavery was continued unmodified; and therein the code of Solon falls far behind that of Moses, which, in an earlier age, and among a less civilized people, had considerably ameliorated the condition of the captive. In barbarous times, the granting the vanquished his life was considered as an act of mercy, and the life thus granted was held thenceforward to belong to the victor: the necessity of personal service in war, often caused the cultivation of the land to be neglected; it seemed natural, therefore, to employ captives in remedying the evils of the war, by bringing the neglected soil into fertility; and the system, once begun, was too convenient to be abandoned. Thus a state of society sprung up, which we can scarcely comprehend, and which put the great mass of the people beyond the pale of the law. Both in Athens and Sparta, the slaves greatly outnumbered the freemen. But such a state of things carries in it the seeds of decay; the free citizens learn to despise honest industry, and to practice oppression; the moral feeling becomes depraved, and the beneficial effect of independence on the human character is lost amid the license of tyranny.

It has been often and well remarked, that the degree of civilization among any people may be judged from the condition of its women. Endued with less of physical strength, that sex can only assume its

dae place where the powers of the mind are more honored than those of the body; and if we are to assume this as a criterion, we must place Athens low in the scale. The laws of Solon forbid a man to *sell* a daughter or a sister unless she shall have been guilty of unchastity: thus it is evident that the whole sex was viewed in the light of domestic slaves, and their injuries were noticed in the law, only in the proportion that it affected him whose property they were considered to be. Thus an adulterer was punished with death, while he who committed violence on a free woman, while single, was subjected only to a paltry fine.\* The degraded state in which Solon found and left that sex, led to a depravation of manners in Athens, and in the states of Greece generally, which, happily, has no parallel in modern times. It would be a relief to pass over so disgusting a subject in total silence, but as, even in our own days, there are some who shut their eyes to the evil effect on society resulting from the degradation of one half of it, there may be some advantage in bringing forward an extreme case, to show that the deficiency in principles of justice which leads to the denial of equal rights to the one sex, very soon leads also to the oppression of the other.

The next in the list of the honored of Greece is CHEILON of Lacedæmon, one of the Ephori of that state. We have nothing left of his but a few moral sentences, and the testimony of those who have reported them, that his life was in full conformity with his precepts. Among these the injunction, "Not to slander our neighbors—to be more ready to share the misfortunes than the prosperity of our friends—to keep watch over ourselves—to suffer harm rather

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\* Plutarch in Vitâ Solonis.

than take a dishonest gain—to be meek when in power—to bear injuries patiently—to seek peace—to honor age—to obey the laws,” are such as an Apostle might give, and an Apostle practice. He died as he had lived, honored and happy; in the embrace of his son, who had just been crowned victor in one of the Olympic games,\* exhausted, it is said, by old age and joy; and has left a fame behind him which the best might envy, for it is the fame of quiet, peaceful virtue, unstained by blood, even in a barbarous age.

PITTACUS of Mitylene, the metropolis of the island of Lesbos, is also reckoned among the sages of Greece; but his name must stand far behind that of Cheilon. His manhood was signalized by the assassination of the then tyrant, or ruler of Lesbos. He himself assumed the government, and conducted it well for ten years;† during which he enacted salutary laws, and at the end of that period, being required by the citizens to descend from his eminence, he did so with a good grace, and lived ten years longer, in complete privacy. One or two of his sayings are remarkable:—“Do not speak evil of your friend, nor even of your enemy—the gods cannot contend with Destiny—it is difficult to be worthy.” And then follows what doubtless, if he deserved the name his countrymen gave him, he must have deeply felt—“Victories should be won without blood,”—and with this sad acknowledgment on his part, that his greatness stood on a false foundation, we will take our leave of Pittacus—great *for* his time, but not *beyond* his time.

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\* Diog. Laert. lib. i. § 72.

† Aristoteles quotes the poet Alcæus to show that Pittacus exercised his power tyrannically. Polit. lib. iii. c. 10.

**BIAS** of Priene also received the tripod. One of his apothegms is, "Speak of the gods as they are," a sentence which implies much; and he inculcated humility, by enjoining, "Whatever thou dost of good, refer it to the gods." His death was patriarchal: for, having undertaken the defence of a friend before the tribunal, on finishing his speech he sat down in apparent weariness, and rested his head on the bosom of his daughter's son, who was there. The adversary's advocate replied; judgment was pronounced in favor of the friend of Bias, and the court being dissolved, the old man, when they tried to rouse him, was found dead in the lap of his grandson: so peaceably had his spirit fled that none had perceived it.\*

**CLEOBULUS**, another of the seven, was, according to the phrase of the time, tyrant, i. e. ruler of Lindos, a town of Rhodes, and yielded in no point to his illustrious friends. He had visited Egypt in quest of science, and had profited by his travels; for his government of the small community he ruled over was just and wise; and he, and his no less accomplished daughter, are celebrated for the gentle virtues they displayed in their elevated rank.† The writings and learning of this princess are celebrated by ancient authors, but none of them have reached us. The sayings of Cleobulus accord with his character:—"Do good to your friends that their friendship may be strengthened, to your enemies that they may become friends:—let your daughters when you give them in marriage, though girls in age, be women in understanding," "by which," says the writer of his life with a laughable astonishment, "he implies that

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\* Diog. Laert. l. i. § 84.

† Cleobulina was wont to wash the feet of her father's guests with her own hands. Clem. Alex. Strom. l. iv. c. 19.

*even* girls should be instructed.”\* “Be more eager to hear than to speak:—avoid injustice:—bridle the love of pleasure:—do violence to no man:—instruct your children:—keep up no enmities.”

PERIANDER, the son and successor of Cypselus, tyrant of Corinth, has by some been placed among the wise seven, though his claim is very questionable, except in so far as he was a patron of learning. He appears to have been on intimate terms with most of the sages of his times, and if he was by them complimented with the tripod, it was probably but a compliment.

PHERECYDES has also been named by some, as numbered among the seven sages of Greece, though it is hardly certain that he was of Grecian birth. He is said to have asserted the immortality of the soul,† and if Ælian is to be credited, was a hardy contemner of the superstitions of his time. His works are lost, and he is chiefly remembered as the first writer of prose, and the instructor of a far greater man, whose commanding mind left its impress for ages on the countries where he taught. This man was PYTHAGORAS.

Those who now visit Calabria would scarcely suppose, from the present appearance of the country, that it was once the seat of philosophy, and of luxury. In fact, Magna Græcia,—for its numerous Greek colonies won it that name in ancient times,—has scarcely anything left to attract the traveler; and there is nothing to remind us of its former glories but here and there a village whose inhabitants still retain the language of their forefathers.† But in the

\* Diog. Laert. lib. i. § 91.

† Cic. Tusc. Quæst. l. i. c. 16.

† Some years back, when traveling in that country, I was as-

days which I am now describing, the southern extremity, just above Cape Spartivento, was occupied by the Locrians, whose lawgiver, Zaleucus, is still celebrated: a little higher, bordering on the now Gulf of Tarento, was situated the city of Sybaris, so famed for the luxury and effeminacy of its inhabitants; and between these two, not far from the present Capo delle Colonne, was placed Crotona, where, after traveling over the larger part of the civilized world, Pythagoras established his school of philosophy.

It matters little where a man was born whose fame identifies him with the progress of the human mind in general: most, however, agree that Pythagoras was a Samian, and that his birth occurred either about 586 or 568 B. C., a difference of date quite unimportant to the present purpose. His early history is involved in much obscurity, but it seems allowed on all hands, that, at some period of his life, he traveled into every country which was likely to afford him knowledge: indeed, that this was the chief purpose of his life, may be gathered from the reply he made when asked what his profession was. It was at once modest and expressive: "I am a lover of knowledge,"\* said he; and the distinction was afterwards adopted by all who devoted their time to science.

Having matured his understanding by this careful cultivation, he began to apply it to the benefit of his fellow-men, and opened a school of philosophy at

sured that there were still three or four villages where the ancient Greek was yet spoken by the inhabitants. The difficulties of the journey, and the time it would have taken, prevented me from going thither to verify this curious fact.

\* Φιλίσοφος. The sages of Greece had hitherto been termed Σοφοί, wise men; Pythagoras modestly placed himself below them in terming himself only *philosophos*, a lover of wisdom.



Crotona, in Magna Græcia. Thousands of both sexes, and of all ages, flocked to hear him, and the reform of manners consequent upon the moral lessons of the teacher, was extraordinary.\* It must remain a matter of deep regret, that the great principles of his philosophy, which influenced his hearers, as truth alone can influence, have not come down to us in his own words; for it is only from a few scattered notices in later authors, who scarcely understood his full meaning, that we can now guess at them even. The command he acquired over the minds of the Crotonians was used in promoting their political, as well as moral well being; when, indeed, were they ever separated? Crotona, under the rule of a council of three hundred, all imbued with his principles, quickly rose to greatness; and during forty years enjoyed unexampled prosperity. The new philosophical sect spread widely in the surrounding countries, and we soon find Pythagoreans dispersed, not only over Italy and Sicily, but in the islands and coasts of Greece; but at Crotona, as elsewhere, prosperity engendered its evils; the state engaged in a contest with, and conquered Sybaris: the people clamored for an equal division of the conquered lands; the demand was resisted, and Pythagoras and his disciples were banished. The philosopher died soon after at Metapontum, another city of Magna Græcia, and Crotona suffered the usual penalty of folly, in the decay of its greatness.

The discipline of Pythagoras extended itself not only to the moral conduct, but to the regulation of dress, of meats and drinks; and a resemblance to the laws of Moses in one or two of his injunctions,

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\* For a longer account of the life of this great man, see Gillies' *Hist. of Greece*, chap. xi.

leads to the conjecture, that in his various researches he had not neglected to study this code also, which, from the intercourse between Egypt and Judea, must have been well known in the former country. No animal not fit to be used in sacrifice was to be eaten by his disciples; and they were commanded, when engaged in any religious rite, to wear clean white garments. Silence, modesty, temperance, and brotherly love, were enjoined; and,—among the candidates for initiation into the deeper mysteries of his doctrine,—a community of goods; the funds of the whole being administered by one of the members:—one of the first instances on record of a collegiate establishment. A probation of five years was expected from his pupils, after which they were instructed in the meaning of the enigmatical sayings, in which, like Orpheus, he involved much of his doctrine. His wife Theano, worthy of such a husband, not only shared his labors during his life, but continued the philosophical school after his death: she is said to have written some works, now lost. Many extraordinary fables are related of Pythagoras, which are so incompatible with the character of the man, that they may safely be rejected:—thus, he is said to have affirmed himself to be the son of Mercury, who offering him any boon short of immortality, he asked that of memory, and, accordingly, professed to recollect the having passed through various bodies. On another occasion he is said to have feigned a descent to the infernal regions.\* These tales probably deserve the same credit as the story of his golden thigh.

Unfortunately, as has been already observed, we have no writings either of the great teacher himself,

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\* Diog. Laert. in vitâ Pythag.

or his no less gifted wife, from which to gather their doctrines; they are, therefore, to be collected only from the reports of disciples. In astronomy, he is thought to have held the same opinion as was afterwards promulgated by his pupil, Philolaus of Crotona, who taught that a globe of fire,—the sun,—occupied the centre of the system, and that round it the other planets revolved. That the earth had a movement on its own axis, and that the revolution made day and night, and gave an apparent motion to the stars. That the earth itself was a spheroid, poised in the air; and that the moon and other planets were habitable globes like our own. A fanciful comparison of the seven primary planets to musical instruments, formed a part of the Pythagorean doctrine; and hence was said to arise that music of the spheres which the ancients were fond of imagining.\* Like Thales, he conceived all matter to consist of certain indefinitely small bodies, incapable of further division, which, from that quality, were called atoms, i. e., indivisible bodies; and that by a certain numerical arrangement,† these atoms formed fire, earth, water, and air; but that by altering this arrangement, air might become water, and water air, &c. That when atoms of fire, i. e., heat, were introduced into water, it became fluid from the separation of its particles; but that fire being of a lighter nature, had a tendency to escape into the surrounding air, which thus either occupying more space, or becoming more dense, by the introduction of extraneous matter, exerted a pressure on the water, and squeezed out, as it were, the remaining particles of

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\* See Brucker, *Hist. Crit. Phil.* pars ii. lib. ii. c. 10.

† “Pythagorei ex numeris et mathematicorum initiis proficisci volunt omnia.” *Cic. Acad. l. i. c. 37.*

fire, until it became solid.\* It would be neither possible nor profitable in this small treatise to follow out these speculations, so imperfectly handed down to us: we may consider them probably, as among those first glimmerings of truth, which great minds see in the distance, though they cannot quite reach them: but whilst raising a statue to Dalton for his proved theory of definite proportions, we should not altogether forget Pythagoras, who twenty-four centuries earlier, would probably have worked it out, had his age been less immeasurably behind him.

In theology, his opinions are not less worthy of remark. "The One Deity is the source of all things; his form, light; his essence, truth; he is the giver of good to those who love him, and, as such, to be worshiped: he is the soul of all things, pervading and maintaining the universe."† "The souls of men exist after the death of the body: all space is full of them,‡ and they are worthy to receive honor

\* Plato Dial. Timæus. This is little else than the doctrine of latent heat. It will probably be found that both are wrong, and that heat is not a substance: but at any rate, modern science has not found it easy to drive Pythagoras from his position, with regard to its mode of operation.

† It is impossible to read these sublime notions of the Deity without comparing them with those of the Hebrew prophets: and when we recollect that Pythagoras was the cotemporary of Cyrus; that he visited Egypt for the express purpose of collecting knowledge, and, as some say, Babylon also, and that the events of the time must have drawn attention to the Jewish Scriptures, we may guess with some degree of probability whence they were drawn.

‡ According to Jamblicus, he divided unseen intelligences into inferior gods, dæmons, i. e. souls of dead men, and heroes: but Jamblicus did not write till the fourth century after Christ; and as this doctrine implies a contradiction which Pythagoras would scarcely have been guilty of, I am inclined to think it has been misunderstood. In a system where the One Deity is the soul of all things, pervading and maintaining the universe, inferior gods would not find place. His doctrine was, doubtless,

and praise when their course in this life has been good and virtuous:—the soul strengthens its holy dispositions by the exercise of devotion:—knowledge should be sought as the means of approaching the nature and felicity of the Deity.” The lofty spiritualism and pure morality of this system long influenced the world; and though the disciples of Pythagoras, like all others who oppose the reigning vices of the age, were persecuted after a time, and driven from Crotona, this did but spread his philosophy more widely. Whether the doctrines of this great man were derived from the countries he visited, or from the depths of his own mind, must remain uncertain: he stands there on the very confines of the darkness of remote ages, like a bright star, whose splendor in its own sphere we can only guess at from the light which it conveys to our far distant orb.

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that of Orpheus, and like it, was misinterpreted in after times. Dæmons and heroes are the same thing, i. e., immortalized souls.

### III.

## IONIA.

FROM 700 B. C. TO 428 B. C.

WHILST Athens under the laws of Solon, and the judicious rule of its mild "tyrants,"\* had been silently, but rapidly advancing in science and arts, the fortunes of Ionia had been various. Within three centuries from their first establishment in this province, the Grecian colonies had risen to opulence by their commerce, and skill in the arts. Miletus, Colophon, and Phocæa, especially, shone forth amid a barbarous age as the seats of luxury and taste; their commerce with Egypt both enriched and enlightened them, and probably laid the foundation of that philosophic school which still sheds a lingering glory over the ruins of that once happy land. But in proportion as the cities of Ionia, and their dependencies, grew in riches and splendor, they became objects of notice to the nations around them, and after some unsuccessful contests, they appear, for the most part, to have fallen under the dominion of the powerful kings of Lydia. When the great struggle for the empire of Asia began, between Cyrus and Cræsus, the alliance of the Grecian cities of Ionia was sought by the former; but at that time they remained faithful to the Lydian monarch. After his defeat, they endeavored to make terms with the conqueror, but it was too late: Miletus only was admitted to treat; the others, in despair, sought assistance from Greece, and Sparta

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\* Peisistratus and Hipparchus.

was already fitting out an armament, when the rapid advance of the Persian generals rendered the succor useless. Priene was captured, the inhabitants sold for slaves, and the surrounding country given up to the soldiery. Phocæa and Teos, warned by the fate of Priene, preferred exile to slavery, and embarking on board their fleet, with their families and effects,\* left an empty city to the invaders. The other towns, after an ineffectual resistance, submitted to the conqueror on his own terms, and as the greater part of the Persian force was then employed elsewhere, these terms were not severe. Under the dominion of Persia the Ionian cities again rose to opulence, and were governed, for the most part, by rulers of their own, subject only to the supremacy of "the Great King." A love of freedom, nevertheless, still lingered among them, which made them unwilling subjects; and Darius, the successor of Cambyses, entertaining some suspicion of Histæus, tyrant of Miletus, sent for him to Susa under pretence of asking his advice on points of government, and kept him there in a sort of honorable confinement.† The wily Greek saw through the pretext, and, being, determined to get free at any hazard, secretly sent to his nephew, Aristagoras, to urge him to revolt, hoping that, in this case, he should himself be sent to quiet the people. Aristagoras was already involved in a disagreement with the Persian authorities when the message arrived; and, accordingly, reckless of consequences, he called the people together, made a public renunciation of the sovereignty on the part of himself and his uncle, and at once raised the standard of independence. This done, not being mad

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\* Marseilles was founded by the fugitive Phocæans.

† Herod. l. v. c. 24.

enough to suppose they could alone resist the might of Persia, he departed to Greece in order to obtain succor from the parent states.

Meantime the Athenians had been engaged in a contest with the Lacedæmonians, in defence of their liberties, and alarmed at having drawn upon themselves the resentment of a state which had taken such fearful vengeance on the Messenians, they sent ambassadors to Artaphernes, the brother of Darius, at Sardis, to ask the protection of the Persian monarch. Artaphernes having inquired where this hitherto unknown state was to be found, briefly replied, that if they brought earth and water, the known tokens of vassalage, to Darius, they might be admitted to his protection; if not, they had better depart. The ambassadors, impressed only with the danger from the arms of Sparta, accepted the humiliating terms. Their conduct was severely reprobated at their return, but this, probably, Artaphernes never knew. Shortly after this, Hippias, the son of Peisistratus, who had in vain sought assistance among the Grecian states, arrived at the residence of Artaphernes. He had allied himself by marriage with the tyrant of Lampsacus, who had considerable interest at the court of Persia; and he thus met with a ready hearing, and the supposed vassals of the Great King were commanded to receive back their prince. At the moment when the indignation excited among the Athenians by this haughty mandate, was at its height, Aristagoras, who had been unsuccessful with the Spartans, arrived at Athens. His artful recommendations were well seconded by the resentment of the people, and an armament in aid of the Ionians was immediately voted and equipped. With their aid, Sardis was taken and burnt, but the force of the confederates being too small to retain their conquest,



it had no other effect than that of incensing Darius\* to the greatest possible degree, by what appeared to him an act of wanton piracy.

Such was the beginning of that Persian war whose events have lived in the recollection and admiration of mankind during nearly twenty-four centuries, and probably will continue to do so to the end of time: for as long as the worth of freedom is known, as long as disinterestedness and self-devotion find any sympathy in the human heart, so long must the bay of Salamis, and the pass of Thermopylæ be remembered and hallowed.

The storm rolled first over Miletus: dissensions among the allies had left it without the expected succor from other states, and, in the sixth year of the revolt, this flourishing city was taken and burnt, its citizens massacred, and its women and children carried into slavery.† All the principal cities of Ionia, as well on the main land as in the islands, with the exception of Samos, which made a timely submission, shared the same fate. The next act of the tragedy was to be laid in Greece itself. After reducing all the smaller insular states, an army of an hundred thousand infantry, besides cavalry, was disembarked, under the guidance of Hippias, on the Marathonian shore, only thirty miles from Athens itself; but the age had made its men; though the force which the Athenians could bring into the field

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\* He commanded an attendant to keep the insult in his memory, by exclaiming every day to him, as he sat at dinner, "Remember the Athenians."

† Herod. l. vi. c. 19. The taking of Miletus having been brought on the stage at Athens, by Phrynichus, the dramatic poet, the whole audience burst into tears; and so deeply were they affected, that a decree was passed, forbidding any future representation of this woful spectacle, under pain of a heavy fine.

was far short of the host of Persia, they had Miltiades; they had Aristides, great enough to divest himself of command, and induce the other generals in chief to do the same, in order that the military skill of his colleague might meet with no obstacle; and they had stout hearts and strong arms to strike for their hearths and homes;—but who is there that now needs to be told the result of the fight at Marathon?

The discomfited Persians retreated to their ships, and this decisive day purchased for the Athenians ten years respite from the vengeance of the offended monarch; during which time their fleet was employed in punishing the island states, which in their opinion had submitted too readily to the Persians. Miltiades at first had the command, and being unsuccessful at Naxos, at his return, wounded and dying, he was impeached and condemned to a heavy fine, or, as some say, to death,—an instance of strange ingratitude, which unfortunately for the fame of Athens, was not without its after parallels.

In order to explain much of what follows, it will be needful to recollect that all through Greece, as must be the case in every country where civilization is rapidly advancing, the inhabitants were divided into two great factions; the aristocratical, and the democratical, or as we now more familiarly term them, the conservative party, and that of the movement. Sparta, whose institutions admitted of no change, was at the head of the conservative, or aristocratic party; Athens, which ever since the death of Codrus, had been verging more and more towards popular government, was the leader of the democratical movement. The descendants of Codrus, still powerful though deprived of the sovereignty, had been the indefatigable opponents of Peisistratus, and having

rid themselves of his family, would brook no other rival near the throne. Miltiades had married a Thracian princess, and was himself the independent sovereign of a part of the Thracian Chersonesus; and their jealousy probably saw in him another Peisistratus, whom it was needful to crush. Xanthippus, who had married the niece of Cleisthenes, the lineal descendant of Alcmaeon, the last archon of the family of Cœdrus, conducted the prosecution of the great general, whose death from the consequence of his bodily and mental wounds, delivered the Alcmaeonidæ from a rival they feared, but left a dark blot on the Athenian name which no time can efface.

Meantime the gathering storm swept onward from the east: Xerxes had succeeded to his father's hatred of Athens, and at last, after subduing all other opposition, he crossed the Hellespont, and prepared to chastise the presumptuous state which had braved his power. But again the great occasion found men equal to it. A handful of Spartans, under their heroic king Leonidas, defended the pass of Thermopylæ against the whole force of Persia for three days, and when at last, by the treachery of a Greek, a body of the enemy was conducted over the mountains, so as to take them in the rear, they died amid heaps of the best troops of the invading force, slain by their brave despair. The victory of Xerxes cost him dear; and though the noble self-devotion of that gallant band failed to arrest his progress, it taught his hosts to dread the obstinate valor of free men, defending all that was dear to them in life, and paved the way for the future triumphs of the Grecian arms. The Athenians, hopeless now of defending their city, by a no less brave resolve, abandoned their property and their homes to the fury of their enemies; and having placed their wives and children in safety, em-

barked on board their fleet, under the command of Themistocles, and with the other naval forces of Greece, met the Persian fleet off Salamis, in a conflict not less obstinate, but more fortunate, than that of Thermopylæ. Xerxes fled discomfited from the scene of his intended triumph, and in the ensuing summer, the two great battles of Plataea and Mycale, fought on the same glorious day, delivered Greece for ever from the dread of the Persian arms.

It is pleasant to look on the bright side of human nature, and after the brave struggle just noticed, the mind longs to find Athens and Sparta, the two eyes of Greece, as they were appropriately termed, traveling hand in hand on their glorious career; but this could not be. Different political institutions held them apart; the high tone not unjustly assumed by Athens, as the Savior of Greece, offended the pride of other states, and dissensions broke out afresh. Faction resumed its sway at Athens as soon as the danger was over, and both Themistocles, and Cimon, the no less great son of the great Miltiades, in turn succumbed to the power of the opposite party. That class of the people which by the laws of Solon had been excluded from offices of state, after the termination of the Persian invasion, claimed a share in the government which their swords had helped to re-establish: the claim was a plausible one, and a relaxation of the law was perhaps called for, under the altered circumstances of the country; but faction had again divided the greatest men of the republic. Themistocles and Aristides took opposite sides, and this latter, glad of an opportunity to curb the power of his rival by gaining the popular favor for his own party, in an evil hour granted the demand in its fullest extent. From thenceforward no qualification of property was required for any office of the state,

and it was too soon found that the hardy, uneducated demagogue, who could win the favor of the ignorant multitude, who were unable to decide on his capacity, might obtain power to ruin his country. The habits of the Athenian citizen, nevertheless, were not altered in a day; the people who had been led by a Themistocles and a Cimon, could not stoop as yet to the guidance of a Cleon, and forty glorious years more are marked as the era of Pericles, a man not unworthy of the great names who had preceded him. During this time Athens arrived at the pinnacle of its power: its edifices were rebuilt in a style which, even in its ruins, still claims our admiration: its sculpture remains unequalled: in poetry, in rhetoric, in philosophy, it has directed the march of the human intellect through all succeeding generations. Ages have passed over, but Athens has had no rival; nor, though the pismire labors of myriads, perpetuated by the aid of the printing press, may carry science forward to greater accuracy of detail, will those master minds who first held the torch to guide us on our way, ever cease to excite our admiration.

Such were the events amid which the philosophy of Greece was rudely cradled. Happily for mankind, it is under this rough nurture that intellect develops itself the most vigorously; and never has the world boasted a galaxy of greater names, than those which threw their lustre over the period which elapsed from the stormy rise of the Persian power, to its decline and final overthrow by the Macedonian arms. It has already been seen, that the wisdom for which Greece honored its sages, was at first chiefly moral and political; the natural sciences were only added, as a sort of pastime, to what they con-

sidered the more important parts of a wise man's study. Of the seven, Thales and Solon alone gave any attention to natural philosophy, and even when their successors saw the immense field of knowledge spread before them, and began to cultivate it, they rarely quite disengaged themselves from politics. Plutarch makes it a reproach to Epicurus, even in his time, that he alone, of all the Greek philosophers, taught his disciples to stand aloof from politics, and prefer a quiet obscurity to public charges and honors.\* There will be need to recur hereafter to this peculiarity in the philosophy of Greece.

While Pythagoras was spreading the light of science in Magna Græcia, and preaching at the same time a faith and morality which a Hebrew prophet would not have disavowed; the school which Thales had founded at Miletus, was carried on by his friend and pupil ANAXIMANDER, and after him by ANAXIMENES, a Milesian also, who appears to have escaped from the desolation of his native city, and to have returned thither when the danger was over. Gross errors in natural science have been imputed to these philosophers, too gross to be believed; for who can imagine that the friend, or as some say, the relation of Thales, supposed eclipses to proceed from the casual shutting of a window in the sun or moon, through which the light at other times proceeded: or, that the cotemporary of Pythagoras, whose disciples were spread over all Greece and Italy, could believe the earth to be an extended tabular surface, when the experience of every mariner of that commercial country would have told him the contrary. Probably in the fatal siege and capture of Miletus the greater number of pupils of this school perished;

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\* Plut. contra Koloten.

and those who in after times prosecuted Anaxagoras, the pupil of Anaximenes, for doubting the divine nature of the sun, we may well suppose paid little attention to the astronomical researches of this school of philosophy.

It has been already seen that Thales held the opinion, that all matter consists of certain indefinitely small particles, and that its first form was water, out of which the Supreme Deity formed all things. Anaximander and Anaximenes both differed slightly from their master as to this first step in creation, Anaximander asserting that infinity, το ἀπειρον, was the source of all material things, from which worlds were constantly in a course of formation, and into which they were re-dissolved :\* Anaximenes affirming this infinity to be the air.† Both have been accused of atheism by subsequent writers : but as Thales, the teacher of Anaximander, and Anaxagoras, the pupil of Anaximenes, both held a supreme Mind to be the plastic force by whose power the universe coheres, so we may justly conclude that their atheism consisted in the rejection of the popular superstitions, and that the sole difference between these masters of the Ionian school consisted in their notions as to the primitive form of matter ; a point of such mere speculation, as to involve no important consequence : for those who held the atomic theory of that age, considered, as we still do, on perhaps more decided proof, that water and air were but different modes of combination of the same material particles. Anaximander is said to have attempted a map of the world, and to have constructed a sphere for that purpose.‡

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\* See Brucker, *Hist. Crit. Phil.*, Pars ii. lib. iii. c. 1.

† Cic. *Lucull. c. 37.* See also *Aristot. Metaph. l. i. c. 3.*

‡ *Diog. Laert.*

He is likewise said to have been the first inventor of the gnomon, and to have constructed one at Lacedæmon.\* He, like the rest of the philosophers of that time, appears to have held the doctrine of Orpheus with regard to the omnipresence of the Deity : thus the heavenly bodies were to be considered divine, not in regard to their material atoms, but as being the seat of a part of the divine power by which they were ruled and maintained.

XENOPHANES, of Colophon, another city of Ionia, is distinguished as the founder of a fresh school of philosophy, differing in some points from that usually called the Ionic. When the Phocæans fled from the arms of Cyrus, a part of them founded the town of Elea, or Velia, in Magna Græcia ; and as the most distinguished followers of the above-mentioned philosopher were citizens of this place, the sect was in consequence termed Eleatic. Xenophanes himself, like others of the Ionians, appears to have fled from his native country to avoid the slavery with which they were threatened by the successes of Cyrus, and to have lived in great poverty in Sicily, where he obtained a scanty subsistence as a bard, singing his own compositions in Zancle and Catana. In these verses, he is said to have ridiculed the fables of Homer and Hesiod relative to the gods, and as the Pythagorean doctrines had spread largely in this region, his satires were likely to have been heard with approbation.

Xenophanes appears to have possessed a mind of peculiar acuteness, which led him to feel dissatisfied with the loose mode of argument adopted in the Ionic school : accordingly we find him grounding his opinions on a very strict course of reasoning. He as-

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\* See Brucker as above.



sumes in the first place as an axiom, that something must have existed externally, because it is an absurdity to suppose that anything could ever have come into existence, had there ever been a time when there was nothing.\* Then, whatever is eternal must necessarily be infinite, as it can have neither beginning nor end—but what is infinite must be ONE, since if there were more, one would set a limit to the other, which is inconsistent with infinity:—and what is essentially one, can have no difference of parts; otherwise there might be a discretion, which would make many things instead of one. Moreover, what is eternal, infinite, and without distinction of parts, must be immovable and immutable, for there can be no place where it is not, therefore, it does not move; nor can it be subject to change, for then it would at some time be what it was not before, which would be equivalent to the creation of a new nature, a thing impossible where there is no more powerful cause existing. There is therefore, ONE ETERNAL, INFINITE, IMMUTABLE BEING, by whom all things consist, and this ONE BEING is GOD; incorporeal, omnipresent.† He has nothing in common with man, either in form or mode of existence,—he hears all, sees all, but not by human senses: he is at once mind, wisdom, eternal existence.‡

The difference between the Ionic and Pythagorean doctrine, and that of Xenophanes, appears to be this:

\* *αίδιον εἶναι φησὶν εἴ τί ἐστιν, εἴπερ μὴ ἐνδέχεται γενέσθαι μὴδὲν ἐκ μὴδενός.* Aristot. de Xenophani, which see for the opinions of this philosopher.

† See Brucker, Hist. Crit. Phil., pars ii. lib. ii. c. 11.

‡ Diog. Laert. in vit. Xenophanias. This writer adds also, “that the substance of God is spheroid;” but Xenophanes was too close a reasoner to advance a contradiction, and Aristoteles does not charge it upon *him*, but upon Zeno Eleates: it is, therefore, evident that on this point the biographer was mistaken.

—that while the former considered the material atoms of which all things are compounded, and the plastic power which called them into *active* existence, as two separate principles, constituting as it were, the soul and body of the world, Xenophanes could not, in the strictness of his argument, allow any second principle, but at once refers all existence to the operation of that single Power, which alone exists necessarily. This controversy has continued to divide philosophers ever since, and will probably never be finished as long as the world lasts; because no advance of science can ever give us *perfect* cognizance of the matter in question. With the perverseness which always leads men to carry a controverted opinion to its utmost verge, the one party has denied the existence of any immaterial principle, —the other, that of any material substance, and both having a portion of truth mixed with their error, have found followers. In our time, Cabanis and Bishop Berkeley have been the most unshrinking representatives of the respective sects of materialists and idealists, or more properly, spiritualists. Cabanis refuses to see in man, or in any material substance, anything but the movement of material parts, consequent on the laws of matter; and asserts that thus certain functions are executed; but here common sense steps in, and decides that though he has given a good exposition of *some* of the phenomena of nature, he has not explained all; and that, therefore, something more is wanting to his theory. Berkeley boldly denies the possibility of proving any material existence whatever; all *apparently external* things are *perceived internally*: the universe, therefore, is an idea in the mind of God, reflected upon the mind of man as in a mirror, and there is no such thing as matter at all. Common sense allows his argument,

and laughs at it: and, notwithstanding all that has been urged on both sides, the bulk of mankind still persists in believing in immaterial as well as material existence.\* As far as pure reasoning goes, the argument of Xenophanes is complete; the physical studies of the Ionic and Pythagorean schools perhaps enabled them to add what they might consider an experimental proof of the eternity of matter; *i. e.*, that through all its countless changes no atom is ever lost; but still this is nothing more than a presumption, and the argument of Xenophanes cannot be shaken: the manner, therefore, in which matter has its existence, will most likely remain an unsolved problem as long as we form part of a material universe.

The opinions of Xenophanes on physics have been strangely reported; probably by persons who did not understand them; for some of the notions imputed to him are too grossly improbable to have found favor with one so well capable of detecting false reasoning. He is said, for instance, to have taught that the stars were nothing but kindled exhalations, which were quenched when they appeared to set, a fresh illumination taking place on the following night. This, at a time when the periodical rising and setting of certain stars had already been noticed and recorded, is clearly an impossible degree of ignorance in a man of Xenophanes' rank in science, and must have been advanced by him solely of those meteors which are still entitled shooting or falling stars. Thus he is also said to have taught that there were many suns, which has been inter-

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\* See, for a fuller examination of the subject, an Essay by M. Jouffroy, *Du Spiritualisme et du Materialisme. Mélanges Philosophiques*, tom. i.

puted to mean that when any accident happened to one, the earth was presently supplied with another: it is a more probable conjecture that, as he taught that there were also an infinite number of worlds, he, like modern astronomers, considered the fixed stars to be suns, giving light to their respective systems. These specimens of misrepresentation may suffice: little is to be gathered from such reporters. Cicero, more exact in his information, tells us that Xenophanes believed the moon to be a habitable globe like our own:\* and he is elsewhere said to have observed the fossil remains found bedded in rocks, and to have concluded from thence, that the earth must at some previous time have undergone notable revolutions, in which the existing race of beings had perished.

HERACLEITUS, of Ephesus, though for a time acknowledged as the founder of a sect of philosophy, delighted so much in enigmatical expressions and mysterious concealment, that even his cotemporaries did not always understand him, and his successors still less. The dogma which is generally held to be especially his, is that fire is the origin of all things, guided by fate. According to Aristoteles, he considered that all nature was in constant movement, one power alone was permanent, and by it all was shaped and fashioned:† this power probably was the *ἐμαρμενης*, or fate, spoken of by other writers, who notice the philosophy of Heracleitus, and by whatever name called, was none other than the One, Unerring, Supreme Will, or Deity, which the whole of the Ionian school acknowledged. It appears,

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\* Cicero, Lucull. c. 39.

† ἔν τῷ δὲ μόνον ὑπομένειν, ἐξ ἧ ταῦτα πάντα μετασχηματίζεσθαι πέφυκεν. Aristot. de Cælo, lib. iii. c. 1.

therefore, that this philosopher only made a slight variation in the previous Ionic theory, by putting fire in the room of water or air, as the first form in which matter existed. It is not impossible that the Magian doctrines,\* which about that time were gaining a wider spread, might have had a share in influencing his views. He is said to have been offered the supreme rule of his native place, by his fellow-citizens, in order to the giving them a wholesome code of laws; but disgusted by the profligacy which he saw around him, and thinking, perhaps, that such a step might give umbrage to the Persian governor, he refused the offer.† He derided the superstition of his countrymen without reserve, telling them that they might as well pray to the stones of their houses, as to a stone image.‡ Some think that he was banished from Ephesus on this account: but the revolt of the Ionian cities, about this time, was a probable reason for his retirement to the mountains, where he lived as a hermit, weeping perpetually, it is said, over the miseries of human existence; which, indeed, were at that time carried to their height in the deplorable calamities of the fairest part of Ionia.

The philosophico-theological creed of those days appears to have been generally that of Orpheus, i. e., that a pervading intelligence animated all nature, and that the human soul was a portion of it: consequently, the blessedness of this latter consisted in a re-absorption into its divine original. The saying of Heracleitus, that "life was the burial of the soul, death, its deliverance from bondage,"—indicates

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\* The Magians, though called fire *worshippers*, merely honored it as the visible representative of the divine power.

† Diog. Laert. in vit.

‡ Clem. Alex. Protrept. c. 4.

such to have been his belief also. His learning was held in high esteem by his cotemporaries, and his name long kept its place among those of the most celebrated philosophers,\* but as he gave no permanent tincture to the opinions of his age, and as, even then, he had the title of *σχοτεινός*, i. e. obscure, it is needless to bestow a longer consideration on his doctrines.

PARMENIDES, one of the most famous of the Eleatic sect, was the cotemporary of Heracleitus. Like most of the sages of old, he was at once philosopher, poet, and legislator, and in this latter capacity bestowed on his native city so excellent a code of laws, that Plutarch assures us it was the practice, even down to his time, to require the officers of the city to swear when they entered upon their charge, that they would observe the laws and ordinances of Parmenides. In philosophy he appears to have endeavored to reconcile the tenets of Pythagoras and the Ionic school with those of Xenophanes. There are in nature, he said, two species of things; the one variable and uncertain, which we view by our external senses and which is a subject of opinion only; the other, one and immutable, to be discovered only by our reason:† a doctrine in which logical reasoning, common sense, and observation are blended, as was to be expected from so eminently practical a man: it must remain, therefore, a matter of deep regret, that of all his writings, both on this subject, and many others which he treated of,‡ only a

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\* Plutarch ranks him with Parmenides, Socrates, and Plato as a moral teacher.

† Plutarch cont. Koloten.

‡ "He discoursed much," says Plutarch, "respecting the earth, and the heavens, the sun, and the moon, and the stars, and the creation (*γένεσις*) of man; and has left nothing unnoticed,

very few disjointed fragments remain. His scholars, and Melissus especially, appear to have pushed his system to the extreme of idealism; asserting that nothing really was generated or decayed, but merely appeared to us to be so.\*

One other less desirable celebrity has been acquired by Parmenides: that of having been the first to assert that the earth occupies the centre of the universe; being so equidistant from all parts, that it remains poised by an equal attraction on all sides. In one point of view this record is curious and interesting, as it shows that the force of gravitation was not unknown to the philosophers of that day. By what arguments Parmenides supported his new opinion we are unable now to tell: for the futile one afterwards drawn by Pliny the elder, from the equal length of night and day at the equinox, seems too slight a foundation for such a man as Parmenides to ground a system upon. Be that as it may, the error spread, and soon became so firmly rooted, that it remained the established creed in astronomy down to the days of Copernicus and Galileo. The only probable cause that can be assigned for so extraordinary a fact, is the desolation brought upon the civilized world by the Babylonian first, and then the Persian conquests. In the burning of cities and temples manuscripts perished: in the massacre or enslavement of the inhabitants of whole regions, those who might have handed down the learning of the preceding age were cut off; and when Athens arose from her ashes, and the cities of Ionia were again peopled, and Egypt revived under the

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for he was a man versed in physiology from of old, and has written his own observations, not those of others." Plut. cont. Kolot.

\* ἔθεν γὰρ ἕτε γινεσθαι φασιν, ἕτε φθίρεισθαι τῶν ὄντων, ἀλλὰ μόνον δοκεῖν ἡμῖν. De Cælo, lib. iii. c. 1.

rule of the Ptolemies, the science of past ages had to be discovered anew. Thanks to the printing press, the world has no reason to dread the recurrence of such a calamity.

The Eleatic sect ended with the disciples of Parmenides, for LEUCIPPUS, though a pupil of one of them, *i. e.*, of Zeno Eleates, may be considered as the founder of a new school, rendered famous by the name of Democritus, and giving rise in part to a yet more famous sect, that of the Epicureans. We have already seen that Parmenides' physiological studies gave him a leaning towards the Pythagorean and Ionian theory of material atoms; that is, he allowed that there was in nature, besides the one eternal existence discovered by reason, something that our senses took cognizance of, though only as a matter of opinion. Leucippus, waiving the argument as to the Being which our reason takes cognizance of, attached himself to researches into the nature of what is obvious to our bodily senses. The universe according to him, consists of an infinite vacuum, and an infinite number of material atoms floating in it, which, by certain movements, and attraction towards each other, become conglomerated, and form the different bodies perceivable by our senses, and which from the same agencies are in a perpetual state of change. The efficient cause of these changes was, according to him, a certain necessity, the nature of which he did not explain.\* There will be occasion hereafter to return to these tenets, when they are more developed by Democritus and Epicurus: it is time now to

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\* εἶναι τι . . . κατὰ τινα ἀνάγκην. Diog. Laert. in vit. Leucip. It has already been seen that this Necessity, or Fate, was acknowledged among the Greeks as the Supreme Deity, to whom both gods and men were subject. See Aristot. de Mundo, c. 7.



turn to the leader of the opposite school, **ANAXAGORAS**, of Clazomene.

This philosopher, whose name has become famous as the instructor of Pericles and of Socrates, was born of noble and wealthy parents, about the time of the Ionian revolt; and early became a scholar of Anaximenes, the then head of the Ionic school. Possibly both might find themselves in the same place of refuge, and thus the young Anaxagoras obtained the advantage of Anaximenes' tuition sooner than he would otherwise have done; for, many years after, when he returned to Clazomene, and saw his paternal inheritance lying desolate, he is reported to have said,—“But for this destruction I myself should have been lost.”\*—Though he is thought to have filled the chair of Anaximenes for a short period, the greater part of his life, after he had attained to manhood, was spent at Athens, which he first visited in his twentieth year, at the very time when its brave citizens were betaking themselves to their wooden walls to preserve the liberty of Greece; and even Themistocles is said, during some part of his brilliant career, to have studied the lore of the young philosopher. It would seem that, after the day of Mycale and the subsequent successes of Cimon had freed Ionia from the dread of the Persian yoke, Anaxagoras returned to his country; but after no long stay there, came back to Athens, where he is said to have spent thirty years.

Anaxagoras saw before him the evils resulting from the system of mystery introduced by Orpheus, which, while it opened its truths only to the learned, left the vulgar a prey to the grossest fictions, and plunged them into both polytheism and idolatry; he proba-

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\* Val. Max. lib. viii. c. 7.

bly saw too the fault of the Ionic doctrine generally, which so united the Divine Spirit with material nature, that it amounted almost to a deification of the latter, and he appears to have resolved to free his philosophy from both these faults. He, therefore, boldly faced the superstition of his time, declaring openly that Phœbus himself, the great Delphian god, was nothing more than a ball of glowing metal or rock, which transmitted its warmth to the earth; and that the moon, the Diana of Greece, the Isis of Egypt, was nothing more than another habitable earth, with hills and valleys like our own. He taught that there was but ONE GOD, and that was the intelligent MIND which had given movement and consequent form to the material atoms of the universe, and which, though it pervaded and ordered all nature, was separate, and unmixed with any material substance.\*

Pericles, the great statesman of Athens, who, before he became acquainted with Anaxagoras, had listened to the far more questionable doctrines of Zeno Eleates, soon became a convert of his teaching: the licentiousness and extravagant luxury which the plundered riches of Persia had cherished and maintained, were already beginning to threaten the best interests of the state, and were deeply felt by Pericles himself, in the unhappy home thus created for him.† There was that in the doctrine of Anaxagoras, which was of power to reform the public morals, and fix the government on a surer foundation; and Pericles and his friends, with a noble enthusiasm, appear to have become the apostles of the new philosophy,

\* Aristot. *Metaph.* l. i. c. 3.

† The wise economy introduced by him into his house expenses was bitterly complained of by his first wife, and his sons by her. See Plutarch's life of this statesman.

new at least in the simple and bold avowal of its principles.

About this time, too, Anaxagoras found another and powerful auxiliary in the person of one of the most famed and the most maligned of all the characters of antiquity. ASPASIA, the daughter of Axiochus, a Milesian, made her appearance at Athens as a teacher of rhetoric and politics.\* Her glowing eloquence, her talents, her youth, her extraordinary beauty, won upon all hearts; and the Athenians, who till then had thought a woman capable of nothing but the superintendence of the loom and the storehouse; who considered a wife merely as a household drudge, and could not suppose that rational intercourse and friendship with a female were possible; suddenly saw themselves obliged to bow before female intellect, and learned the eloquence which was to captivate the multitude, and the arts by which they were to wield the power of the state, from female lips. The most distinguished characters in Athens attended her lec-

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\* Aspasia has been stigmatized as a courtesan, a charge not very compatible with a life so devoted to learning as to have made her an able teacher of the above sciences at a very early age. When we recollect, too, that the severely virtuous Pericles made her his wife; that their only son, though illegitimate by the laws of Athens because his mother was a foreigner, must, from his age, have been born some time after their marriage; and that Socrates, in after times, carried the wives and daughters of his friends to profit by her conversation and instruction; we may well believe that the reproaches so plentifully cast upon her, were but the calumnies of a faction, invented for a political purpose. Those really known to be courtesans, Lais for instance, or Theodota mentioned by Xenophon, Mem. lib. iii. c. 11, made no pretensions to philosophy: but on the other hand, those who did study philosophy, and spurned the silly etiquettes of Grecian society, were thus stigmatized by the impure and the envious; and later writers have repeated the charge without examination.

tures; Pericles,\* then in almost the height of his power, and Socrates just entering upon life, alike sought her instruction. She herself embraced the opinions of Anaxagoras, if, indeed, she had not already been trained in his school at Miletus, and appears to have co-operated with all her power in the project of reforming the religious creed, as well as the manners, of the country. Euripides, the tragic poet, enlisted himself in the same cause, and the new sect spread so rapidly as to alarm the opposite party. The conservatives of Athens dreaded, or affected to dread, the change of manners likely to be introduced by the new system;† and a decree was procured, that those who disputed the existence of the gods, or broached new opinions respecting celestial appearances, should be tried before an assembly of the people. The comic poets, whose gross ribaldry had always been discouraged by Pericles, were the ready tools in the hands of the opposite faction; and after a series of both personal and political libels, aimed at the great statesman, the master-stroke was attempted, by attacking his private friend no less than

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\* Pericles' famous funeral oration for the slain at Samos, is said to have been composed by Aspasia. See Plato. Menex. She is said also to have been the adviser of that expedition; a stroke of policy questioned by some, but which, by establishing the popular party in Samos, gained a new ally for Athens.

† At the time when this law was proposed, the religious festivals, sacrifices, &c., supplied the indigent citizens with a considerable part of their maintenance. Even the theatrical entertainments, which the Athenians were so passionately fond of, were exhibited at a religious festival, i. e. the Dionysia, or feast of Bacchus; and a gratuity was distributed to the people on that occasion. It was easy, therefore, to rouse them to maintain those rites which furnished them with so large a part of their subsistence. The expense which this entailed upon the state, became at last so ruinous, that within fifty years after, we find Demosthenes complaining that the money which should have maintained their fleet and troops, was wasted in feasts and plays.

himself with a series of prosecutions. Phidias, the still unrivaled architect and sculptor, was thrown into prison on frivolous pretences: Pericles himself was called on to give an account of his administration, in terms that implied a reproach, and Anaxagoras and Aspasia were prosecuted under the new law, for impiety. A farther ridiculous charge was added against Aspasia, as it had been against Phidias, of keeping free women in her house for the private pleasure of her great pupil: a charge, which the character given of Pericles by the great cotemporary historian of Greece, sufficiently disproves, even if the commonest principles of human nature had not sufficiently convinced us already, that a woman engaged in such traffic could never have been the confidante and guide of the great and wise minister of Athens. But it is scarcely indulging a conjecture to suppose that the scheme for the reform of religion and manners, embraced that of restoring women to such a position in society, as should curb the fearful depravation which so unblushingly prevailed: and the young women of free or noble birth whom Aspasia entertained in her house, were no doubt her pupils; but in a nobler science than the gross minds of her accusers could understand. The stepping beyond the walls of the Gynæceum and mixing in general society, were things as much proscribed by the customs of ancient Greece as of modern Turkey, and those who disdained these restraints were instantly supposed to have broken through all others.\*

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\* Some amusing instances have occurred in modern Turkey of the impression made on the minds of pashas and other dignitaries, by the unveiled and unrestrained women of Europe: courtesy alone preventing them from characterizing such females in the same terms that the ancients used in speaking of the female philosophers of their time.

Pericles found it beyond his power to save both the accused, though he personally undertook their defence. For Anaxagoras he pleaded the blameless life they had all witnessed, and with difficulty obtained the commutation of the sentence of death into banishment; which he lightened as far as possible, by carrying his honored instructor a part of the way towards Lampsacus, his future abode, in his own chariot. In Aspasia he felt a yet dearer interest, and in her cause all the powers of the rhetoric he had learned in her school were exerted: but nature taught a better rhetoric still: the danger of one he loved so well overcame the proud reserve of the statesman and the general; he burst into tears; and to those unwonted tears the sensitive Athenians granted what their fanaticism or their party spirit would perhaps have denied to arguments; Aspasia was acquitted "much against the tenor of the law," observes the biographer, and Pericles, as she had been so nearly sacrificed on his account, resolved to shelter her in future, and made her his wife.

Anaxagoras is said to have fallen into so much poverty at Lampsacus, that he had covered his head to die; but Pericles, hearing of his state, hastened to him, and by timely succor, and friendly assiduity, lengthened the life of his friend and instructor, whose decease did not occur until the year after that of his noble pupil. The opinions of this philosopher on physics, have, as usual, been very imperfectly reported: he appears to have differed slightly from Thales in regard to the elemental form of matter, which he considered as consisting of various kinds of perfectly similar particles,\* each species of which,

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\* αρχὰς δὲ τὰς ὁμοιομερείας. Diog. Laert. in vit. Anaxag. Cic. Lucull. c. 37.

by natural attraction, joined into one substance :— thus, that the matter of bone would be formed of one kind of particles,—flesh of another, and so on. Such at least is the representation given of his opinion on this head, by Aristoteles and Lucretius, who combat it with more violence than justice perhaps, for the ancients were by no means precise in the use of the word *στοιχεῖα*, *elements*, and it is most probable that Anaxagoras did not understand it in the same sense as his opponents, and that his *ἀμολογῆσται* were merely what we should now call compound atoms, not elemental ones, which latter, among the more ancient natural philosophers, would have been termed principles. The notion that bodies consist of similarly formed particles, was perhaps adopted from observing the constitution of minerals of easy fracture, which constantly split into similar forms; reasoning from analogy, he might conclude that such could be the case with all substances, if they could be split in like manner. He is said to have considered earthquakes as the effect of air within the earth;— wind as the effect of the rarefaction of the air by the sun; lightning as the effect of friction of the clouds on each other: modern philosophy has not much to change in this.

In treating of the opinions of the ancient philosophers we must always recollect that the fragments of them which remain to us, are for the most part, handed down to us by persons who evidently were ignorant, in many cases, of the very first principles of the philosophy they report; so that all the observations, arguments, and experimental proofs, by which the students of nature in ancient times supported their views, have been wholly lost. Aristoteles, the only person capable of doing justice to his predecessors, was not born till nearly fifty years

after the death of Anaxagoras; and between the banishment of this latter, and the establishment of the former as a teacher, nearly a century elapsed; so that he, clear and logical as he was in all his reasonings, wanted the proper data on which to ground them, whilst criticising the supposed tenets of those who preceded him; and in no instance is this more apparent than in his mention of the philosophical views of Anaxagoras. Yet we have in his writings valuable remnants of them, which give rise to a suspicion that they were more profound than his own. On the subject of the soul, he acknowledges that Anaxagoras, while asserting that one Supreme Mind put dead matter into motion to form the universe, asserted equally that the moving power in man, and the soul, were two distinct things; and that this latter was of a nature unlike any material thing, and separate from the bodily perturbation of the passions: in which opinions he stood alone,\* says the Stagyrice; a point, however, which admits of considerable doubt.

The natural philosophers of the earlier ages have probably been too lightly esteemed of late; they have been held wild theorists who hit right sometimes by chance; but it has not been sufficiently considered that while the road to truth is but one, the ways of error are innumerable; and that, therefore, the hitting right by chance is not a thing of such common occurrence as to justify us in assuming such to have been always the case. Numa is said to have fetched lightning from the skies at pleasure, by a process which was attempted by his successor, Tullus Hostilius; who, failing, killed himself and burnt his palace.† The art was said to have been well known to

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\* Aristot. de Anim. lib. i. c. 2.

† Plin. Hist. Nat. lib. ii. c. 52.



the old Etrurians; some acquaintance with the laws of electricity, therefore, must have been possessed by these persons. Pythagoras, who visited Italy shortly after Numa's death, might well become acquainted with the science of Etruria, from whence he probably gained the true notion of the Solar system which Numa also appears to have possessed:\* but of the philosophy of Pythagoras, or the science of Etruria, alas! what now remains to us?—Yet even in these short and scattered notions, misunderstood as they were by those who handed them down to us, there is enough to give the modern philosopher room for thought, and perhaps to raise a suspicion in his mind that he is but re-discovering what former observers had known, if not so accurately, at least with some degree of certainty.

The decree procured by Diopithes, by which all question of existing opinions on theology or astronomy was made an indictable offence in the Athenian state, closes the first epoch in the history of Greek philosophy. The philosopher had hitherto been the guide and the lawgiver; and had been looked up to by all classes as one who deserved the highest honors. A mistaken notion, originally adopted in Egypt as it would seem, that the lower people were unfit for the knowledge of the highest truths, and that these were to be reserved for the initiated alone, was first brought into Greece by Orpheus; and his successors too readily adopted it. The vulgar were left at the mercy of the superstition which so readily springs up in untaught minds, and the philosophic lawgiver, instead of seeking to enlighten them, received the popular faith as the foundation for his code, and placed the fetiche of the

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\* See Plut. vit. Num.

people among the things acknowledged and honored by the laws. Not that it is possible to root up *by force* a cherished popular superstition; that would be an insane attempt: but the ignorance which cherished it ought to have been combated, and, except by the so-called tyrant Hipparchus, it was not. This bad seed bore bitter fruit: the simple religion of the heart, which was of force to influence the life when duly appealed to, gradually gave place to a mass of fable which the very *canaille* laughed at whilst they upheld;—witness the favored comedies of Aristophanes;—and to a set of obscene ceremonies which sapped the very foundations of public morals; till at last this ugly offspring of the Orphic secret doctrine grew to power enough to be a fit ally for a political faction. Henceforward we shall no longer see the philosopher as an honored lawgiver; his next appearance will be as a fearless martyr to the truth; avowing his opinion and dying for it.

THE END.



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*Lucull. c. 2.*

A BRIEF VIEW

OF

GREEK PHILOSOPHY,

FROM THE

AGE OF SOCRATES

TO THE

COMING OF CHRIST.

*Caroline M. ...*

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PHILADELPHIA:  
LEA AND BLANCHARD.  
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## CHRONOLOGICAL TABLE.

B.C.	OLYMP.	
471	LXXVII. 2	Birth of Thucydides the historian. Banishment of Themistocles.
470	— 3	Birth of Socrates.
450	LXXXII. 3	Archelaus, the pupil of Anaxagoras, flourished.
449	— 4	Death of Cimon.
445?	LXXXIII. 4?	Anaxagoras is banished for "impiety," being then aged about 55.
444	LXXXIV. 1	Thucydides the son of Melesias banished. Protagoras the sophist flourished about this time: also Empedocles.
440	LXXXV. 1	Comedies interdicted by law. The Samian war.
437	— 4	The law prohibiting the representation of comedies repealed.
436	LXXXVI. 1	Revolt of Potidæa.
432	LXXXVII. 1	Beginning of the Peloponnesian war.
430	— 3	Plague at Athens.
428	LXXXVIII. 1	Plato born.
425	— 4	Cleon takes the command at Sphacteria. The Acharnians of Aristophanes represented at the Dionysia.
424	LXXXIX. 1	Battle of Delium, where Socrates is said to have distinguished himself. Aristophanes' "Knights" represented.
423	— 2	Aristophanes' "Clouds" represented.
422	— 3	Aristophanes' "Wasps" represented. Brasidas and Cleon killed at Amphipolis.
416	XCI. 1	Diagoras the Melian, called also the atheist, is condemned to death for "impiety:" on his non-appearance at his trial, his sentence is published, and a talent offered for his head, or two talents to whoever should deliver him up alive. Agathon gains the prize of tragedy.
415	— 2	Alcibiades is impeached for ridiculing the mysteries, and mutilating the statues of Mercury. He goes into voluntary banishment.



B.C.	OLYMP.	
414	XCI. 3	Diogenes of Sinope born.
413	— 4	The Athenians defeated at Syracuse.
412	XCII. 1	The rule of the 400 established at Athens. Protagoras prosecuted by one of them for "impiety"—his books burned, himself banished.
406	XCIII. 3	The battle of Arginusæ fought. The victorious commanders tried for not burying the bodies of the slain, and on this pretext, put to death. Socrates refused to do his office of president on this occasion, asserting that the proceeding was illegal. Sophocles died.
404	XCIV. 1	The Athenians defeated at Ægospotamos: Athens taken by Lysander: the rule of the thirty established: the walls of Peiræum, which were built by Themistocles, destroyed by the Lacedæmonians. Alcibiades assassinated.
401	— 4	The rule of the thirty overset by Thrasybulus, and the old government restored.
400	XCV. 1	Socrates put to death on the accusation of Anytus, Melitus, and Lycon.
396	XCVI. 1	Agésilas King of Sparta successful in his attack on the Persians.
390	XCVII. 3	Rome burnt by the Gauls under Brennus.
388	XCVIII. 1	Plato visits Sicily for the first time.
384	XCIX. 1	Aristoteles born.
376	CI. 1	Pyrrhon, the head of the Skeptic sect, born.
371	CII. 2	Epaminondas, the Theban general, defeats the Spartans at Leuctra.
368	CIII. 1	Aristoteles comes to Athens and enters the Academy. Eudoxus the astronomer flourished.
359	CV. 2	Philip of Macedon mounts the throne. Death of Xenophon.
348	CVIII. 1	Death of Plato. Aristoteles leaves Athens and visits Hermeias, tyrant of Assus and Atarneus.
345	— 4	Aristoteles takes refuge in Mitylene after the capture and execution of Hermeias.
344	CIX. 1	Timoleon delivers Syracuse from the tyranny of Dionysius the younger.
343	— 2	Aristoteles is invited to the court of Macedon to superintend the education of Alexander, who was then fifteen years of age.
342	— 3	Epicurus born.

B.C.	OLYMP.	
340	CX. 1	Anaxarchus, an Abderite of the school of Democritus, flourished; he was the master of Pyrrhon.
339	— 2	Death of Speusippus. Xenocrates succeeds him in the Academy.
338	— 3	Battle of Cheronæa, where Philip broke the power of Greece.
336	CXI. 1	Philip of Macedon is assassinated.
335	— 2	Aristoteles comes to Athens, and opens a philosophical school in the Lyceum.
334	— 3	Alexander begins his expedition into Asia.
324	CXIV. 1	Death of Alexander. Death of Diogenes of Sinope, aged 90. He is succeeded by Crates.
323	— 2	Aristoteles, to avoid a prosecution for impiety, flies to Chalcis. Epicurus, aged 18, comes to Athens from Samos, where he was educated.
322	— 3	Death of Aristoteles at Chalcis, aged 63. Epicurus quits Athens and joins his father at Colophon.
318	CXV. 3	Demetrius Phalereus, a Peripatetic, made governor of Athens by Cassander.
316	CXVI. 1	Arcesilaus born.
315	— 2	Death of Xenocrates, Polemon succeeds him in the Academy. Stilpo flourished. Zeno of Cittieum, founds the Sect of the Stoics.
308	CXVIII. 1	Athens restored to its freedom by Demetrius Poliorcetes. <i>Heeren</i> .
307	— 2	Epicurus establishes himself as a teacher at Athens.
301	CXIX. 4.	Battle of Ipsus, in which Antigonus, the father of Demetrius, is defeated and killed, and his possessions divided amongst the conquerors. Demetrius flies to Greece, but is denied refuge by the Athenians.
97	CXX. 4	Demetrius again obtains possession of Athens.
294	CXXI. 3	Demetrius is placed on the throne of Macedon by the army.
288	CXXIII. 1	Death of Theophrastus, aged 85: Strato succeeds him at the Lyceum.
287	— 2	Athens throws off the yoke, and resumes its ancient government; Demetrius, though driven from his throne, nevertheless invests the town, but at the persuasion of Crates

B.C.	OLYMP.	
		yields to their wishes. He passes the rest of his life in exile with his father-in-law, Seleucus. <i>Heeren</i> .
284	CXXIV. 1	The Ætolian league formed for defence, against the oppression of Macedon; accession of Ptolemy II., called Philadelphus.
281	——— 4	The Achaian league renewed by four cities which had freed themselves from their tyrants.
278	CXXV. 3	Irruption of the Gauls into Greece, under another Brennus. They take Delphi. Sosthenes, King of Macedon, is slain in battle with them. Antigonus Gonatas, the son of Demetrius, takes advantage of the opportunity to seat himself on the throne of his father. Pyrrhus, King of Epirus, drives him thence for a time, but after the death of that monarch, he again obtains the kingdom.
275	CXXVI. 2	Pyrrhus defeated by the Romans, after considerable successes in his invasion of Italy.
272	CXXVII. 1	Pyrrhus killed in his attack upon Sparta.
271	——— 2	Death of Epicurus, aged 72. Death of Strato Lampsacenus, the Peripatetic. He is succeeded by Lycon.
264	CXXIX. 1	Death of Zeno of Cittieum, founder of the Stoic sect, aged 98?
260	CXXX. 1	Victory of the Roman Duilius over the Carthaginians by sea.
251	CXXXII. 2	Sicyon, under its deliverer Aratus, joins the Achaian league.
244	CXXXIV. 1	Attempt of Agis, King of Sparta, to restore the ancient laws of Lycurgus.
243	——— 2	Corinth and Megara join the Achaian league.
242	——— 3	Death of Antigonus Gonatas.
241	——— 4	Death of Arcesilaus, aged 75. Agis, King of Sparta, his grandmother and mother put to death.
229	CXXXVII. 4	Athens joins the Achaian league. <i>Heeren</i> .
226	CXXXVIII. 3	Cleomenes, King of Sparta, carries out the designs of Agis.
215	CXLI. 2	Death of Lacydes, the successor of Arcesilaus in the Academy.
214	——— 3	Carneades born.
211	CXLII. 2	Alliance of Rome with the Ætolians, in which Sparta, Elis, Attalus of Pergamus, and

B.C.	OLYMP.	
		Skerdilaidas, and Pleuratus of Illyria join : finally also the Athenians and Rhodians.
203	CXLIV. 2	Philip of Macedon makes war on Attalus, the ally of Rome.
200	CXLV. 1	Rome declares war on Philip.
197	— 4	T. Quinctius Flaminius terminates the war with Macedon by the victory of Cynoscephalæ.
196	CXLVI. 1	Greece restored to its freedom by Flaminius.
188	CXLVIII. 1?	Philopœmen compels the Lacedæmonians to demolish their walls and abrogate the laws of Lycurgus.
183	CXLIX. 2	Death of Philopœmen, the general of the Achaian league.
168	CLIII. 1	The battle of Pydna, which subjects the Macedonian kingdom to Rome.
166	— 3	Perseus, the last king of Macedon, dies at Rome.
155	CLVI. 2?	Carneades is sent to Rome on a mission from Athens, in company with Diogenes the Stoic, and Critolaus the Peripatetic.
146	CLVIII. 3	The Achaïans declare war against Sparta and Rome, upon which being worsted, Achaia is declared a Roman province. A nominal freedom is left to Athens, and some other considerable cities.
129	CLXII. 4	Death of Carneades, aged 85.
87	CLXXIII. 2	Athens taken and ruined by Sylla, 1 March. <i>Heeren.</i>
80	CLXXV. 1	The Academy ends with Antiochus Ascalonita.
63	CLXXIX. 2	Marcus Tullius Cicero, consul.



## I.

### STATE OF ATHENS—SOCRATES.

B. C. 470 TO B. C. 400.

THE former part of this little work exhibited the fortunes of Greece and its civilization, from its first dawns in the ancient kingdoms of Sicyon and Argos, up to its meridian of splendor under the great men who maintained the liberties of their country against the mightiest empire then existing:—wrenched from the invader even more than he had won from them,—and bequeathed to the next generation the fame of their deeds, and the plunder of Persia for their inheritance. They were two dangerous gifts. Athens, rich, powerful, proud of her place in the van of Grecian combatants, which her great generals had won for their country, and presuming on the supremacy of the seas, which none could now contest with her, ruled her dependencies with no light hand; and Sparta, jealous of a greatness which it feared in its growing might, and hated for the opposite political system which it everywhere supported, lent a ready ear to the complaints of Athenian oppression made by the discontented. Yet the great league for the humiliation of Athens, which united against her nearly all Greece in the Peloponnesian war, found the force which had humbled Persia no easy conquest, and nearly thirty years of almost single-handed conflict scarcely sufficed to undo the work of Themistocles, of Cimon, and of Pericles. Nay, when she did fall, it may be truly said, that it was not so much the might

of her enemies, as the internal vices of the state, which broke her strength, and paralyzed the exertions of that once high-minded people.

In the earlier part of the Grecian history, we have seen that the natural respect for superior knowledge had generally given to the philosopher the task of legislating for his countrymen; but the decree of the Athenian people, procured by Diopceithes about sixteen years before the commencement of the Peloponnesian war, by which any attempt to innovate on the existing popular superstition was made a capital offence,\* was the commencement of a new epoch. It will be desirable before entering upon it to take a slight view of the previous state of Athens.

The fundamental principle of the Athenian constitution, as settled by Solon, appears to have been that of resting the government of the state in those who had a sufficient stake in it to make it their interest to preserve peace and good order; and as the minimum property qualification for political office was not more than would now be equal to about forty or fifty pounds per annum, of freehold property, and the fourth class, or Thetes, who were excluded from office, were nevertheless allowed to serve on juries,† and vote at elections; the state, even by his code, must have made as near an approach to a pure democracy as was consistent, probably, with a due administration of the laws. Solon appears, indeed, to have intended to set up an antagonist power in the court of Areopagus, consisting of those who had held the highest offices of the state; and to have guarded against the precipitation of popular movements

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\* See Plutarch, vit. Peric.

† I use this term as approaching the nearest to a description of the office filled by the dicast. These juries, however, consisted of many hundreds.

by the various forms appointed to be gone through in the Council or Senate, before a law was presented to the assembly of the people for its final confirmation or rejection; but still there is no modern government which is so completely popular. Perhaps we have a nearer approach to the Athenian constitution, in the municipal government of the city of London, than in any other existing institution; the Livery, Common Council, and Court of Alderman, representing tolerably well the Assembly of the People, Senate, and Court of Areopagus, of Athens.

Before Solon undertook the reform of the laws, considerable oppression must have been exercised, for the very prohibitions show the practices that had existed. Bondage was abolished; and no man was allowed to pledge his own body as security for a debt, or to sell his children or other relatives: mortgages and debts, which were become ruinous from the excessive rate of interest, were reduced by some equitable arrangement, which cleared the land of its burdens, or were rendered less onerous by a reduction of the rate; and a provision was made for such as should be mutilated in war, or otherwise incapacitated from maintaining themselves. In order to claim this latter provision, however, it was needful to prove, that the whole property of the claimant did not amount to more than the worth of three minas, or about twelve pounds sterling; which, calculating the price of articles of necessity at that period, was about equal to forty pounds in our own age and country.\* All extreme indigence was in this manner avoided; for the sum bestowed was sufficient to purchase a full supply of food daily; and thus, those who had little or no property, had still an interest in

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\* Boeckh, Public Econ. of Athens, Bk. ii. c. 17.



the maintenance of good order, as their own well-being depended on it. Orphans, whose fathers had perished in war, were the charge of the state ; they were fed, clothed, and educated up to eighteen years of age, then provided with a complete suit of armor, and enrolled in the army. They were the especial children of their country, and as such bound to defend it.

Though bondage among the native Athenians had been abolished, slavery was still permitted : in those times it was so universal, that it would scarcely have been possible to have abolished it in one small state ; and though we may probably trace the downfall of all the republics of antiquity to that cause, yet the evil grew up so gradually, that it was difficult at its commencement to anticipate the fearful magnitude that it would arrive at. Probably, in Solon's time, the slave was but a workman to aid the citizen in cultivating his lands : but we generally see, that ere long, the distinction between the free man and the slave is placed in the exemption of the former from manual labor ; and then idleness and dissipation, and all their demoralizing influences, follow. They did so at Athens to a frightful extent.

By the laws of Solon, the expenses of the religious festivals and sacrifices were limited ; but this part of the code very soon became a dead letter ; for as the beasts offered were distributed among the poorer sort, those chiefs who wished to gain the popular favor, took this indirect mode of securing it. Splendid feasts, and immense sacrifices were made on all occasions by those who were rich, and wished to be powerful, until the people learned to consider this as an indispensable part of the administration of the state ; and, from a private disbursement, it became a public one. Pericles has been accused of

having been the first thus to apply the public money, and of having by these means, hastened the ruin of the country. The law of Diopceithes, however, shows that his cotemporaries suspected him of an intention to make a considerable change in this respect; which in fact was made, during the zenith of his power, by the interdiction of the exhibition of comedies at the festival of the Dionysia. This law remained in force only three years, at the end of which time it was repealed, and comedies were again acted: it would seem, therefore, that he only yielded to a torrent which he was unable to stem. This great man seems to have entertained the splendid project of making Athens the head of the whole Grecian confederation; and, probably, he contemplated the introduction of a better system as soon as this should be accomplished: for the life of Anaxagoras seems to have been especially precious to him, on account of the aid he expected to derive from him in the administration of the state. This seems the more likely, because from the time he triumphed over his opponents, his biographer tells us, that he assumed a more authoritative manner; and seemed determined to rule, rather than to conciliate the people. Had he lived, it is likely that he might have accomplished his purpose; but his death left the moral plague of the state to be treated by unskillful hands, and the patient sunk into a state of incurable disease.

The dicasts, or jurymen, appointed for the hearing of causes, were required by the laws of Solon, to give their services gratis; unless, indeed, we may suppose the prytancia, or small deposits, paid into court by each party on commencing an action, were distributed among the dicasts from the first. When, therefore, the jurisdiction of Athens became extended, and the whole of her dependencies were com-

pelled to bring their suits to her courts, this duty became onerous ; and, in the time of Pericles, the custom was introduced of paying one obolus, per cause, to each of the dicasts, as a small remuneration for the time thus consumed ; which, as they were mostly artisans and people of small means, they could not afford to waste. But the custom being once introduced, it became the means of gaining popular favor at a cheap rate in the hands of subsequent demagogues ; and the pay was augmented from one obolus to three, as most think, by Cleon. As the dicasts employed in one cause amounted to some hundreds,\* this soon became a source of maintenance to many, and there was thus a strong inducement to lengthen out causes, to the great inconvenience of suitors from a distance, who then had recourse to bribes, to induce the needy dicasts to make a speedy decision, and allow them to return to their homes. This was undoubtedly one of the causes that hastened the downfall of Athens, for it created universal discontent among the states subject to her, and as universal a political corruption among her citizens.

The condition in which the laws of Solon placed the female sex was not favorable to morality. Though by this code, their sale was forbidden, excepting in cases of gross misbehavior, yet the permitted sale on these occasions, at once put them on the footing of slaves ; and the numerous burdensome regulations which their movements were subjected to, with the view, it would seem, of *compelling*

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\* The ten courts at Athens required five hundred dicasts each ; thus five thousand citizens received daily pay, excepting on holidays, which perhaps amounted to about sixty days in the year.

an unremitting attention to domestic affairs, prevented any of that intercourse with the external world, which would enlarge the mind, and make the wife or the mother an object of respect to the husband or the son. Ignorance and narrow-mindedness are an ill soil for any graceful virtue to grow up in; and, however much Aristophanes may have libeled his countrywomen, we cannot avoid confessing, that a state in which such libels could be listened to patiently, must have arrived at a fearful point of licentiousness, as far as regarded the manners of the male sex, if not also of the female.

The consequences of unintentional oversights, and intentional party measures in modern legislation, can hardly be judged of by those whose minds are still heated by the political contests they have been engaged in: it is instructive, therefore, to contemplate the primary causes of failure in legislative enactments, at a distance of time that may allow us to judge of them calmly. In the course of a century, Solon's laws were become almost nugatory, and we can now see that his code carried the seeds of its own decay. It permitted slavery;—and hardy industry soon gave place to idleness and profligacy:—it withheld the truth from the people, and countenanced a false superstition;—and this was soon made the tool of faction; and religion, instead of a guide to the heart, became a calculation of interest, or an excuse for profligacy;—it found and left women in a state of slavery:—and such a frightful demoralization and degradation of the other sex ensued, that no modern writer can even touch upon the subject without disgusting his readers.

Such was the state of Athens, when the great man, who amid such wide-spread corruption still maintained his integrity, was snatched from his post by

the plague which desolated the city about the end of the eighty-seventh Olympiad. We have traced with admiring eyes the hitherto glorious career of this small state; we shall now have to follow its decline, and with it, that of its rivals: for, as Athens had marched in the vaward of Grecian civilization and greatness, so her downfall was followed, in no long time after, by that of her short-sighted enemies. Sixty years after the long walls, planned by Themistocles, and built by Pericles, had been pulled down by the Spartans, the decisive battle of Cheronæa laid the liberties of all Greece at the feet of Philip of Macedon. Sparta, which had but its iron men to recommend it, sunk into irrecoverable ruin,—the late, but unfailing retribution for the national sin of Helotism:—but Athens, though its political existence was lost, still kept its place as the seat of art and science; its schools supplied a preceptor for the conqueror of Persia, and even as late as the time of Cicero, foreigners traveled thither to study philosophy.

The buoyancy of the human mind is not easily crushed, and though Anaxagoras died in banishment, this did not prevent ARCHELAUS from filling his chair at Athens; but made cautious by the fate of his master, he confined himself mainly to physics, taught the easy doctrine, that nothing was right or wrong *per se*, but became either the one or the other by the law of the state,\* and by dextrously trimming his course to the times, escaped the danger of offending the people.

About this time, Criton, a rich Athenian, was one day passing the small workshop of a sculptor, where a young man was busily employed at his trade: he had seen this youth before, listening with eager at-

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\* Diog. Laert., lib. ii., §§ 16, 17.

tention to the philosophical lectures of Anaxagoras and Archelaus, and he entered into conversation with him ; for it was something unusual, even in Athens, to see the laborious earnings of a young and unknown artist devoted merely to the pursuit of philosophy. Criton was charmed with the talent, as well as modesty of the young student ; and, with a generosity which at that time, probably, he little thought would immortalize his name, bestowed on the intelligent youth the means of pursuing his studies without need for farther manual labor.\* The name of this youth was **SOCRATES**.

Athens was then in the zenith of her power, yet whoever watched the state of society, could hardly fail to observe in it the seeds of dissolution. The enlightened Pericles had failed in his endeavors to set a higher standard of religion and morals ; and his wise and excellent preceptor had suffered the penalty of preaching the truth too boldly. The grossness of the public exhibitions, and the license of convivial meetings were such, that the great and virtuous man who held the reins of government would never countenance them by his presence ; and yet this, instead of discouraging the practice, only excited the vengeance of the comedians and debauchees of the city. Pericles was made the mark for insult and calumny, but vice walked abroad as unblushingly as ever.

It is easy to conceive what must have been the impression made by such a state of things on a young and earnest mind, which had drunk in, as its first milk of knowledge, the sublime doctrines of Anaxagoras. Socrates caught up the mantle of the prophet, like another Elisha, and vowed himself to the

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\* Diog. Laert., lib. ii., § 20.

improvement of his fellow men. In the *gymnasia*, in the *agora*, in the workshops of the citizens, he was constantly to be found, mixing with the throng, detecting and reprobating vice, and teaching men, by pertinent and searching questions, the folly, as well as the immorality of their conduct. His skill in disputation was soon exercised by a set of men, who about this time sprang up, under the title of Sophists; persons who professed to be acquainted with the whole round of science, and capable of imparting this knowledge for a large sum of money.\* Philosophy was the fashion, and, among the young nobility, these teachers found numerous pupils, who learned from them that species of reasoning which to this day is called *sophistry*, and with it a morality so loose and large that *immorality* would be a more proper term for it. The *ichneumon* is not a greater enemy to a serpent, than Socrates was to a sophist: he foiled them with their own subtleties of speech, and detected the fallacies of their argument by a series of close reasoning which nothing but truth can endure. The noble youth of Athens enjoyed this war of wits, and followed the steps of the moralist more for the sake of amusement than profit; but they followed; and Socrates, if he could not win them to virtue, at least taught them to respect it.†

It is not now possible to tell exactly what were the political views of the philosophical party in Athens. That there was such a party, formed as early as the time of Pericles and Anaxagoras, can

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\* Protagoras of Abdera, said to be the first who received money for his instructions, charged an hundred minas, or upwards of £400 of our money, for the complete education of a pupil. See Boeckh's *Public Economy of Athens*, Book i., ch. 21.

† See Xenoph., *Memor.*, lib. i., c. 2, § 24.

hardly be doubted; and subsequent events lead to the conjecture that the abolition, or at least, modification of the democratical power, was one of its objects; a design which, though distasteful enough to the people, might certainly be entertained at that period by a true patriot, as the only means of preventing the ruin of the state, and with it, of Greece generally, and almost of mankind; whose higher destinies seemed at that time cradled in that small nook of earth. Socrates appears to have formed a hope,—not unnatural in one who felt his own great powers and upright intentions,—that he might so far influence the young men who crowded round him, as to prepare a happier future for his country and for Greece. Alcibiades, whose talents and rank pointed him out as a fit successor to his uncle Pericles, was the object of his first attention:\* he followed him in the crowd; sought his confidence, and succeeded so far as to win the esteem and affection of that most versatile and profligate of all the Athenians; but he could get no farther, and he seems to have turned in despair from him, to others more likely to fulfil his wishes.

Xenophon, the future leader of the ten thousand in their perilous retreat, was the next whom he cast his spell upon. Meeting him in a narrow way, he stopped his progress with his staff; and after asking him some few questions of less import, inquired of him where and how good and upright men might be found. It was a puzzling demand in Athens at that

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\* The profligacy of the age, which could not even believe in virtue, assigned a less pure motive to the attention of the philosopher; but the unvarying testimony of his pupils, and of Alcibiades himself to the virtue and self-denial of this excellent man, leave it only to be regretted that any modern writer should think such calumnies worth repeating.



time, and the young man hesitated. "Come, then," said Socrates, "and learn."\*—He did so, and to him it is that we owe the lovely portraiture of the life and conversation of the master whom he never afterwards forsook. But the talent and worth which Socrates had so anxiously cherished for his country's benefit, was never used in its service. Xenophon too was banished, for a supposed leaning to the policy of Sparta. He also had probably adopted the political views of the philosophical party.

The last on whom Socrates seems to have founded his hopes, was the younger Pericles; the son of the gifted Aspasia. Xenophon has left us a touching account of an interview between the young warrior, just appointed to command, and the now aged philosopher, who still, with all the buoyancy of youthful hope, endeavored to inspire his pupil with the spirit of his great parent.† He found an apt scholar, and the victory of Arginusæ, where he was one of the commanders, threw a final lustre over the last scion of a race identified with the glory of Athens.‡ But the son of Pericles, and the disciple of Socrates, now a victorious general, was too dangerous to the demagogues of Athens to be allowed to live: the conquer-

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\* Diog. Laert., lib. ii., § 48.

† Xenoph., Memor., lib. iii., c. 4. The elder Pericles lost both his sons by his first marriage, in the great plague, at the beginning of the Peloponnesian war. His son, by his second marriage with Aspasia, was legitimatized by the gratitude of the people of Athens, though the mother was not a citizen of that state.

‡ Pericles, the elder, was the son of Xanthippus, who commanded at Mycale; and his mother was the niece of Cleisthenes, by whom the tyrant Hippias was driven from Athens. Alcibiades was the son of his brother: the victorious commander at Arginusæ was the last of the family, apparently, if we except a son of Alcibiades made memorable only by a pleading of Isocrates on his behalf.

ing chiefs were recalled,—accused upon frivolous grounds,—and the assembly of the people excited against him by the basest arts: no defence was listened to, the forms of law were broken through, and he, and such of his colleagues as returned with him, were condemned to death. On that day Socrates was one of the presidents of the senate, whose duty it was to put the question to the assembly; and in the face of that incensed multitude, edged on by their leaders, and howling like wild beasts for their prey—a scene, as Xenophon describes it, which might have appalled the bravest—the only bold man in Athens stood up, faced their fury, and refused to put a decree in writing which was contrary to law,\* or to countenance the condemnation of innocent men: but he stood alone; none had courage to second his righteous determination, and the victors of Arginusæ were sacrificed to the popular madness. That fearful night, when one scream of lamentation ran from Peiræus to the city, after the fatal defeat of Ægospotamos, when no eye in Athens closed to sleep,—well revenged them on their murderers:—the last hope of the state sunk in those bloody waves, and the rule of the thirty tyrants followed the surrender of the city to the Lacedæmonians.

The tyrannous proceedings of these men soon excited the animadversions of Socrates; and Critias, one of the number, who had formerly been among his disciples, and who had been roughly reprovèd by him for his vices, sent for his old teacher, and enjoined him silence. Finding him unyielding on this point, another plan was tried; and he was commanded, with three others, to seize Leon of Salamis,—a man whose only crime was his coveted wealth,

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\* Xenoph., *Hist. Gr.*, lib. i., *Memor.*, l. i., c. 18.

—and to conduct him to death. It was hoped thus to make the philosopher a sharer in the crime, and to disgrace him in the eyes of the people; but that fearless moralist heard the order with silent contempt, and instead of executing it, retired to his house.\* Still, amid all their crimes, the former disciples of the sage could not resolve on ridding themselves of his remonstrances by the hand of the executioner, and he survived their rule. But the presence of a man whose integrity neither fear nor interest could warp, was beginning to be irksome in a corrupt city; and scarcely was the ancient government restored, before an accusation was preferred against him under the law of Diopeithes, for introducing new gods, and for corrupting the youth of the city.†

Socrates was now verging on seventy, and his life had not been such as to make death an evil to him; his resolution therefore was quickly taken: it was a part of duty to submit to the laws, therefore he came into court and pleaded; but he disdained any of the mean arts usual on such occasions: instead of seeking to excite the compassion of the judges, he reminded them of his own virtuous life, in which none of the duties of a citizen had been neglected. He was accused of being a corrupter of youth;—he appealed to the Pythian oracle, which had pronounced him the wisest, the freest, and the most upright of men; and then doing himself a justice which the occasion demanded, he continued,—“Whom have you ever known less in bondage to the pleasures of sense? whom more free? since I have taken neither gift nor reward from any. Whom would you consider more upright than one who satisfies himself

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\* Plato, *Apol. Soc.*

† *Diog. Laert.*, lib. ii., § 40.

with what he has, without wishing or asking for anything from others? or wiser than one who, from the time he could understand what was said to him, has never ceased to seek and to learn what was good and right to do? And that I did not labor in vain, the esteem of all good men, whether at home or abroad, has shown." With a noble confidence he called upon his accusers to show the youth whose piety, or whose morals he had injured.—"But," said the persecutor, "you have taught them to listen to you, rather than to their parents."—"When I was more able to teach them what was right and good, I confess it," replied the sage;—"you trust your son to the physician's care, rather than your own, when he is sick."\*—Plato, then young, and an ardent admirer of his great master, whom, when old himself, he still professed to consider as the best and the wisest of men,—attempted to speak in his justification; but he was under the age at which citizens were permitted to address the people, and he was silenced.† On taking the votes, Socrates was condemned by 281 against 275: it remained only to assign the sentence. Criton and Plato tried to commute it for a considerable fine, which they were ready to pay, in order to preserve their beloved friend; but the democratic party, joined with those incited by private pique, carried the original proposition; and the greatest man Athens ever produced, was condemned to death. He heard his sentence with the calmness that might be expected from his character, and left the court with these remarkable words:—"An unjust sentence is no dishonor to me; on those who have pronounced it, falls the shame; for I know well that all future time will testify, as the past has done, that no one ever suffered injus-

\* Xenoph., Soc. Def.

† Diog. Laert., lib. ii. § 40.

tice from me; that no one was a worse man through my agency; but that it was always my endeavor, without fee or reward, to benefit all who conversed with me, and to make them wiser and better men." Having thus spoken, he left the court with a cheerful countenance, gently chiding his weeping friends for their sorrow.

It would be a pleasant task to trace more at large the life and death of a man, whose long and bright career seems to have been marked by less of human frailty than is usually found, even among those whom we call the best; and who, in disinterested exertion for the good of his fellow-creatures, regardless of personal safety, yields only to that ONE with whom no mortal can be placed in competition. But the limits of this small work forbid the attempt.

It would be vain to trace the philosophical system of Socrates; he had none but such as springs naturally from a belief in a superintending Providence, and a future state; a faith which leads equally to humility and to virtue; and whilst others admired his wisdom, he professed that it consisted merely in being aware that he knew nothing. Like Anaxagoras, he lived for another world;\* and in another world he has doubtless found his reward. His life was his philosophy.

Various have been the opinions respecting the heavenly voice which Socrates, it is said, asserted to have been the guide of his actions: but if we may credit Plutarch, who makes Simmias, one of Socrates' most favored companions, say, that he had asked his former teacher concerning it, and received

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\* When some one asked Anaxagoras if he felt no anxiety to return to his country; "Yes," said he, pointing to the skies, "to my real country." Diog. Laert., in vit. Anaxag.

no answer;\* and who doubtless reports the traditions handed down in other writers; the mode of this intervention was quite unknown; and it must remain a matter of doubt whether, when Socrates claimed the divine admonition from within, he intended to allude to anything beyond that guidance which a soul purified by faith, prayer, and a temperate life, and cultivated by useful study, is wont to receive from its Creator. The commonest experience must have taught us that the image of God within us is a reflected one only, and the mirror that is kept the brightest and cleanest, will reflect it the best. He whose life and thoughts are modeled according to the pattern of the Deity, even though the imitation be but a distant one, acquires something of his foreknowledge also, for he sees the true consequences of actions; and many times will almost pass for a prophet with those whose minds have been less carefully trained. But even should we believe that the virtuous Socrates did indeed lay claim to a special divine guidance, why should we think a Greek unworthy of what was vouchsafed to a Hebrew? If the "Word of the Lord" came to Amos "among the herdsmen of Tekoa," why should the humble shop of the sculptor be unvisited, when a preacher of righteousness was to be raised up, whose voice should recall men to the path they had wandered from? A voice which, in fact, did echo from heart to heart, long after the mortal frame of the speaker had crumbled into dust. The acuteness, the integrity, the common sense, so apparent in the character of Socrates, equally forbid us to suppose him either an enthusiast or a deceiver: if, therefore, he claimed a divine mission, he did it not without good grounds; and who will say that he was unworthy to have received it?

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\* Plut., de Socratis dæmonio.

## DEMOCRITUS AND HIS SCHOOL.

B. C. 480 TO B. C. 404.

BEFORE entering on the examination of the different philosophical sects which had their origin among the pupils of Socrates, it will be necessary to notice another and cotemporary school, that of DEMOCRITUS. This philosopher, who lived to the extraordinary age of 104, or, as some say, of 109 years, was a native of Abdera, a city of Thrace. He was a child when Xerxes passed the Hellespont; and made such large requisitions for the entertainment of himself and his army from the countries he traversed, that one of the citizens of Abdera is said to have observed, that "the Abderites ought to go in procession to the temples to thank the gods for not inclining Xerxes to eat twice a day, instead of once, for if they had been commanded to provide a dinner for him equal to his supper, they must have been reduced to utter beggary."\* The father of Democritus was noble and wealthy; and his entertainment of the Persian monarch was so liberal, that the king is said to have left him some of the Magian and Chaldean sages in his train, as preceptors for his young son.†

It was probably owing to this circumstance that the mind of Democritus was turned so strongly to philosophical pursuits. In order to acquire all the knowledge then to be found in the world, he traveled for many years, over all the countries which had the reputation of science. After spending his

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\* Herod., lib. vii.

† Diog. Laert., lib. ix., § 35.

whole substance in this pursuit, he returned home, and lived in the most frugal manner, on the bounty of his brother; but nothing could deaden his thirst for knowledge; and in his humble dwelling, he still pursued his experiments in philosophy, and his researches into the nature of things. Once he visited Athens, and boasted that he had seen Socrates, though unknown to him,\* and to the Athenians generally; for he seems to have shunned celebrity, as much as his friend and disciple Protagoras sought it. He is said to have derided the follies of men as much as Heraclitus had lamented them, and rarely to have appeared in public without laughing at what he heard and saw: and this is not surprising; for as his time was almost wholly devoted to experimental philosophy, he must have found ample room for ridicule in the vulgar errors of his day upon such subjects. The moralist, Heraclitus, on the contrary, could have found no room for merriment in the licentiousness of his country.

As the writings of Democritus are lost, it is impossible to say what extent of knowledge his researches had acquired for him; the loss is the more to be regretted as there is scarcely a subject in natural philosophy which he did not treat of; and from his habits of careful experiment we may suppose that he did not assert lightly what he taught on such subjects. Somewhat of private pique at finding that Anaxagoras shunned his acquaintance, led him to treat the opinions of that philosopher with little respect: for he averred that the notion of the Ionian sage respecting the sun and moon, *i. e.*, that of their solid, terrestrial nature, was not by any means his own, but stolen from the doctrine of the ancients on

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\* Diog. Laert., lib. ix., § 36.



that subject; and he “pulled to pieces” also,—such is the expression of his biographer,\*—the opinions of Anaxagoras respecting the formation of things, and the creative mind. By the term *διακόσμησις*, *i. e.*, generation or government of things, he probably understood the *ὁμοιομέρεια*, or exactly similar particles which went to the formation of each body, according to the system in question. The difference between the two philosophers on this point appears to have been, that Anaxagoras believed the particles to have no natural movement, and to be the mere clay in the hand of the potter,—the stuff which the Eternal Mind (*νοῦς*) moulded to his will by an immediate art;—Democritus, on the contrary, considered the atoms which he supposed the universe to be composed of, to have peculiar inherent qualities which form a part of their very nature; not of color, smell, taste, heat, or cold, these being mere accidents resulting from a peculiar state or combination; but a disposition to a peculiar movement, by which these combinations were effected. In this, if our modern philosophy mistake not, Democritus was nearer right than his rival; for it is by the properties impressed on matter in the first instance, or, in other words, by the forces thus brought into action, and not by immediate interference, that the hand of the Creator manifests itself. As far as modern discovery has gone, we are obliged to acknowledge a considerable variety either in the elemental atoms themselves, or their properties; for oxygen of the same volume contains sixteen times the weight of hydrogen, and thus it becomes clear, either that the elemental atoms of which it is composed must be more dense, or the substance less elastic, or that the particles must ex-

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\* Diog. Laert., lib. ix., § 35.

ercise a less repulsive power, and thus be more numerous in a given space. Democritus having arrived at the point, that the coherence of the universe, and the phenomena of matter, might all be traced to the primary qualities of the elemental atoms, paused; "we know not the cause of this," said he, "the truth is hid very deep."\* His early intercourse with the Magians, and his own subsequent researches, seem to have led him to lean to the notion, that as the sun's light and heat were the great agents in the combination and movement of the primary particles, so that some divine power resided in it, and that it might be considered as the soul of the world.†

The life and moral doctrines of Democritus were pure, and his death peaceful. He is said to have considered the great happiness of life to consist in the freedom from tormenting cares and fears, and superstitions; the most blessed state being that of complete tranquillity. He has been called an atheist, so also was Anaxagoras, and so also were the first Christians; we may conclude, therefore, that this term, in the language of the times, meant no more than that the person so distinguished, did not believe in the established superstitions.‡ Deeply engaged during his whole life in physical research, Democritus appears to have contented himself with leaving untouched the arcana which he could not penetrate. He was aware that there were great truths which he had not reached; and we may pro-

\* αἰτιή δὲ ἐδὲν ἴδμεν, ἐν βυθῶ γὰρ ἡ ἀλήθεια. Diog. Laert., lib. ix., § 72.

† See Cyril cont. Jul., lib. i.

‡ To this day, in Italy, all who doubt of the Romish *fables*—not of the fundamental doctrines, on which the Romanist unites with all Christian churches—are currently termed atheists.

bably, with more justice, call that humility which his successors called atheism. He fulfilled his duties to the best of his power, and waited patiently for more light; not deeming that he knew, and not hoping to know those deep things, whose full profundity none ever feel so thoroughly as those who have pushed research to the utmost; and having done so—having, like Vishnu in the Hindù fable, burrowed in the earth, and soared in the air, and yet failed to find either the head or feet of the Creator—bow their wearied heads in the dust, and acknowledge the difference between the Finite and the Infinite.

Democritus had several disciples: among these, two of the most famous were his fellow-citizen PROTAGORAS, and DIAGORAS, the Melian. The former is said to have been originally a wood-cutter from a neighboring village, whose clever mode of tying up his load attracted the attention of Democritus in one of his walks:\* he undertook his instruction, and under his tuition, Protagoras acquired rhetoric and philosophy. The former wood-carrier profited so well by his master's teaching, that he soon became famous, and was one of the first of the class already mentioned, on whom the title of sophist was bestowed, and who undertook, for a sum of money, to teach the whole round of science to whoever sought their instruction. Though the sketch which Plato has given us under his name must have owed much to the imagination of that most graphic of writers,—for when Protagoras visited Athens, the author of the dialogue was not yet born,—yet as doubtless the scene he gives was drawn from the life, it will be a relief from graver and drier matters, to take a view

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\* Athen., l. viii. 50. The circumstance is mentioned also by Aulus Gellius.

of the interior of a great man's house in Athens, where no less than three famous sophists were the guests. The scene is laid about the time when Athenian power was at its height, just before the Peloponnesian war; and when the banishment of Anaxagoras had made way for a very different style of philosophy. Socrates was then young, and he is, as usual, introduced by his clever disciple as a sort of lay figure, to be dressed in the garb best suited to the occasion.

“Hippocrates, the son of Apollodorus,” says the pseudo relator, “came this morning before it was light, and knocked at my door with his stick: as soon as it was opened, he came straight to my room, crying, ‘Socrates, are you awake?’ and I, knowing his voice, replied: ‘Why, this is Hippocrates!—what is the matter?—’—‘Nothing, or nothing but good.’—‘So much the better; but what is it?—and why are you come now?’—‘Protagoras is arrived,’ said he, coming nearer. ‘He has been here some time,’ said I; ‘have you only just heard it?’—‘By the Gods! not till last evening;’—and, feeling about for my bed, he sat down at my feet, and said, ‘Last evening coming back late from CEnoe, for my slave Satyrus had run away from me,—and certainly I should have told you that I was going after him, but something else put it out of my head;—after I had got home, and we had supped, and were going to bed, my brother told me that Protagoras was arrived; and then I was immediately coming to you, but I thought the night too far advanced; and so, hastily taking the sleep which my fatigue required, I presently rose and came hither.’ I, knowing his warm temper, asked him if Protagoras had injured him in any way? ‘Yes, by the Gods, Socrates,’ replied he, laughing, ‘for he chooses to keep all his learning to

himself, and will not make me wise too.'—'By Jove,' said I, 'if you persuade him, by giving him plenty of money, he will be very ready to make you learned also.' 'Oh Jupiter, and all the Gods! if that were all,' exclaimed he, 'I would not leave a penny in my own purse, or my friends' either. And it is exactly for this that I am come to you, that you might speak to him for me; for I am young, and I never saw Protagoras, or heard him speak. I was a child when he first came to Athens, but now I hear everybody praising him, and talking of his skill in speaking. Why cannot we go to him now, when we shall be sure to find him at home? He is staying, as I hear, with Callias, the son of Hipponicus. Let us go.'—'By no means, my good friend,' said I, 'it is too early: but we will go into the hall, and there we may walk and pass away the time till it is light; then we will go; for Protagoras usually spends his time in doors, so that we may be tolerably sure of catching him within.'" Socrates is then made to question his friend as to what he proposes to learn from Protagoras. Hippocrates confesses that by going to a sophist for instruction he must learn to be a sophist himself. "And would you not be ashamed to be known to the Greeks as a sophist?" asks his friend. "Why, by Jove, if I am to confess the truth, I think I should," replies the young man: however, an Athenian's curiosity being excited by "some new thing," must be gratified, and the friends depart for the residence of Callias; but some difference of opinion having arisen in their conversation by the way, they walk up and down before the door till they have settled their dispute. "The porter, who is a eunuch," pursues the narrator, "I fancy heard us, and it seems that he had been put in an ill humor with all who approached the house, by the

influx of sophists ; for when we knocked at the door, he opened it a little way, and seeing us, exclaimed — ‘ Oh, more sophists ! He has no leisure to attend to you ;’ and taking the door with both his hands, he flung it to with a hearty good will. We knocked again, and he, keeping the door shut, replied from within—‘ Have you not heard what I told you ? He has no time to attend to you.’ ‘ But,’ said I, ‘ we do not want Callias, and we are not sophists ; do not be alarmed ; we are only come to call upon Protagoras : will you announce us ?’ But even then it was with difficulty that we persuaded him to open the door.

“ When we entered, we found Protagoras walking in the front colonnade (prostoia), and with him were walking, on the one side, Callias, the son of Hipponicus, his half brother Paralus, the son of Pericles, and Charmides, the son of Glaucon : on the other side were Xanthippus, the other son of Pericles, Philippides, the son of Philomelus, and Antimærus the Mendian, the most promising of Protagoras’ disciples, who was learning his art in order to become a sophist himself. Behind them walked others who were listening to the conversation ; these, for the most part, appeared to be strangers, who had followed Protagoras from the towns he passed through, caught by the sweet tone of his voice, as the beasts followed Orpheus : some, too, there were from the neighborhood, who filled up the attending chorus. I was amused to see the admirable order observed by these listeners, and how careful they were never to advance beyond Protagoras ; for as soon as he and his companions turned, they opened on each side in a half circle, to allow him to pass, and then again ranged themselves respectfully behind.

“ I next perceived, as Homer says, Hippias of Elis,

enthroned in the opposite colonnade; and sitting below him upon the steps, Eryximachus, the son of Acumenos, and Phædrus, the Myrrhinusian, and Andron, the son of Androtion, and some strangers, fellow-citizens of Hippias, mixed with others. They seemed to be asking Hippias questions in physics and astronomy, and he, from his throne, replied, and explained the things asked. There too I saw Tantalus,\* that is to say, Prodicus of Ceos, who was also lately arrived. He was in a little room which had been formerly used as a storeroom by Hipponicus; but now, on account of the influx of strangers, Callias had emptied it, and given it up to their use. Prodicus was still in bed, smothered in skins and coverlets, as it seemed; and sitting beside him, was Pausanias of Ceramis, and, beside Pausanias, a youth of particularly agreeable countenance, that seemed a great favorite of his. I thought I heard him called Agathon. There were besides, the two Adimanti, the one the son of Cepis, and the other the son of Leucolphides, and some others. I could not hear the subject of their conversation, as I was outside, though I was most eager to hear Prodicus, as he appears to me to be a thoroughly learned and divineminded man; but his voice being very deep, produced a sort of humming in the room, which hindered me from hearing distinctly what he said. We entered, and soon after us came the handsome Alcibiades, and Critias, the son of Callischros.

“After we had been there a short time, and had contemplated the scene before us, we advanced towards Protogoras, and addressing him, I told him that Hippocrates and I were come to speak with him.

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\* In the original, some passages from Homer's description of the infernal regions are parodied.

‘Do you wish to see me alone, or here among the rest?’ said he. ‘No matter; when I have told you our business, you will yourself judge what is proper.’” Socrates now explains Hippocrates’ wish to become his scholar, and then asks if he thinks proper to speak with him privately or not: to which Protagoras replies, “You have judged right, Socrates, regarding me; for a stranger traveling from one great city to another, and in each of them persuading the youth of the highest rank to quit their friends and connections, and attach themselves to him, only that they may become better by their intercourse with him, has need of caution; for he is sure to encounter no small hatred, as well as other discomforts and enmities. I, however, maintain that the sophist’s art is a very ancient one; but those who first exercised it, fearing the disagreeable consequences, endeavored to hide it under various pretexts and disguises; some veiling it in poetry, as Homer, Hesiod, and Simonides; others giving it the character of initiations and oracles, as Orpheus and Musæus: others have carried it on under the name of gymnastics, as Iccos of Tarentum, and as is still done by a sophist of our day, who yields to none in skill, I mean Herodicos the Selymbrian, whose ancestors were of Megara: your Agathocles too, an excellent sophist, made music his pretext, as did Pythocliides of Ceos, and many others. All these, as I have told you, fearing the envy they might encounter, concealed their profession under the veil of these arts: but I do not approve their plan, for I am of opinion that they did not effect what they intended; since it was quite impossible to conceal themselves from those in possession of authority, on whose account, nevertheless, these disguises were assumed: and as for the many, they, so to speak, know nothing, but raise a



cry only when they are told to do so." He then goes on to claim for himself the merit of frankness in avowing boldly his profession, and offers to hear what they have to say in the presence of the whole party.

"I knew," continues the imaginary narrator, "that his object was to act a good figure before Prodicus and Hippias, by letting them see that we had quite fallen in love with him; I therefore asked if we should not call them and their friends, to be present at the conversation. 'Certainly,' said Protagoras, and Callias inquired whether seats should not be prepared, that all might speak or hear at their ease. We all approved the motion, and set to work to carry chairs and benches to the side where Hippias was; because there were already some seats there. Meantime, Callias and Alcibiades came back, bringing with them Prodicus, whom they had induced to rise, and with him those who had been sitting in his room."

Protagoras, who throughout is made to speak with considerable affectation of eloquence, now addresses himself to the young man, promising him, that under his instruction, he shall every day find that he has made some advance in knowledge. Socrates asks him, what sort of knowledge? Protagoras replies, with great politeness, that it is a very proper question, and that it is pleasant to him to answer such; and adds: "If Hippocrates follows me, he will not be wearied with the things which other sophists would compel him to learn. They, when they take a young man, how much soever he may shun the arts, lead him back to them in spite of himself, teaching him figures, and astronomy, and geometry, and music"—and whilst saying this, he cast a meaning glance on Hippias—"while, if he follows me, he

will learn nothing but what he comes to learn, for my instruction will only have for its object the guidance of his conduct both in public and private affairs."—Farther questions are then put in the mouth of the imaginary narrator, by which the false moral system of the sophists is exposed: upon which, Protagoras is made to close the conversation with a compliment to Socrates on his clever management of the dispute, "which really augured considerable eminence in the art as he grew older," and a polite announcement that he had other business to attend to.

After this spirited sketch of the character of a sophist, little more need be said of Protagoras. His skepticism brought him at last into ill odor at Athens; and the books in which he asserted that there were no certain means of knowing whether there were gods or not, were condemned to be sought out from all those who possessed them, and burnt by the hands of the executioner. He himself was banished from the city, and required never again to set foot on Attic soil.\* If, as some say, the accuser was one of the four hundred, this must have occurred B. C. 412.

DIAGORAS, the Melian, was likewise a pupil of Democritus, but not a sophist. He has been branded by all antiquity with the title of "the atheist," from his daring contempt of the superstition of his times. For this he was tried at Athens, and as he did not appear in order to defend himself, his sentence was engraved on a brass column; by this a talent (about £240) was offered for his head, and two talents to whoever should take him alive, which implies an intention of adding torture to death.† This sentence was passed B. C. 416. The offences proved, appear

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\* Diog. Laert., in vit. Protag. Brucker, Hist. Crit. Phil., Pars II., lib. ii., c. 11.

† Brucker, ib.

to have been, the divulging the secrets of the mysteries; and on some occasion, when fire-wood was wanting, the using a statue of Hercules for that purpose, with the observation, that he would give the god a thirteenth labour, that of cooking the dinner for Diagoras.\* What his real sentiments were, we have no means of judging but from his life, which, like that of his master, Democritus, appears to have been blameless. A writer who was better able to judge of this matter than we can now be, makes that the test of his belief, and it is probably a just one. "It is wonderful to me," says Clement of Alexandria, "how Euhemerus the Agrigentine, and Nicanor the Cyprian, and Diagoras, and Hippon the Melian, and that Cyrenian who came a little after them, Theodorus by name, and many others who led excellent lives, and were only clearer sighted than others as to the errors current regarding the gods, should have been called atheists. If they did not actually know the truth, they at least suspected the error, and kept alive the embers of that true knowledge which afterwards enlightened the earth."—We may reasonably conclude that the persons here referred to, would scarcely have exposed themselves to danger by a public exhibition of their contempt for the popular superstition, unless they had had some feeling of a higher and nobler truth, which they were eager to draw attention to; mere contempt would have smiled at the folly, and lived quietly in the midst of it. The law of Athens was not unknown; it was scarcely passed, ere Anaxagoras, no obscure man, was its victim, and escaped with his life only through the influence of Pericles, then so powerful in the state: it seems, therefore, hardly possible to avoid the conclusion already drawn, that the philosophical party

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\* Clem. Alex. Protrep., c. 2.

was a political one also, the leaders of which were pursuing, — too carelessly, perhaps, as regarded practicability, — an ideal state of perfection; and sacrificing themselves without regret to the promotion of this great object. Their followers, such as Alcibiades, Critias, Theramenes, and others, saw in the doctrines of the philosophical party, the means of advancing themselves,\* and used the self-sacrificing philosophers as their stepping stones to power and place. It may be observed in confirmation of this, that when Alcibiades was banished for his supposed profanation of the mysteries, and mutilation of the statues of Mercury,† his enemies “bellowed, that these arts struck at the very foundations of the democracy;”‡ for the subsistence of the lower classes of citizens was at this time so bound up with the existence of the superstition of the state, that the subverting the one was supposed to be tantamount to the starving the other. As the Peloponnesian war advanced, the impoverishment of the citizens of course kept pace with its progress: and, in consequence, we find the proceedings against all “impiety,” as it was called, were more and more virulent. The contest, although the philosophers were the sufferers, was in fact between the aristocratic party, or that of persons who thought their rank in the state gave them a right to govern it, and the democratic, or that of those who, having the art of exciting the people, sought to bear rule by their means. This state of things is by no means obsolete.

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\* Xenophon expressly affirms this to have been the case. *Memoral.*, lib. i., c. 2.

† They were blocks of stone rudely fashioned, and so little decent in their form, that Philip of Macedon’s jest, in which he likened the Athenians to their own statues of Mercury, is too coarse to be here repeated.

‡ Thucyd., lib. vi.

### III.

## PLATO AND THE ACADEMY.

B. C. 389 ? TO B. C. 80.

THE death of their great master was the signal for the dispersion of all who had been known as the especial disciples of Socrates. Those who came from foreign countries returned to their homes, and those who were natives of Athens sought shelter either with them, or in more distant lands: PLATO, especially, betook himself to foreign travel as most preceding philosophers had done. After staying for a time with Euclides, at Megara, he proceeded to study geometry under Theodorus, at Cyrene: he then visited Egypt to learn astronomy, and from thence passed into Italy, where he sought to make himself acquainted with all that had been taught in the schools of Pythagoras.\* He was preparing likewise to visit India, but was deterred by the wars then carrying on in Asia. From Italy he crossed over into Sicily,† to view Mount Ætna, and there became acquainted with Dionysius the elder, the tyrant of Syracuse, by the intervention of Dion, whose sister this latter had married.

This young noble had eagerly sought the conversation of Plato, and believed, with all the ingenuousness of youth, that the tyrant would listen to the precepts of the philosopher; but when the pupil of

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\* See Brucker's *Hist. Crit. Phil.*, Pars II. lib. ii. c. 4.

† Plutarch in *vit. Dionis*.

Socrates began to explain the charms of virtue, and like Paul, to reason of righteousness, temperance, and it may be, also, of a judgment to come,—for even this seems to have formed a part of the Socratic doctrine,—Dionysius could bear it no longer,—asked him what business he had in Sicily;—and not only dismissed him rudely from his presence, but bribed the master of the vessel in which the philosopher hastened to depart, either to put him to death on the passage, or to sell him for a slave. The seaman complied with the latter part of the behest, by carrying him to Ægina, the inhabitants of which were then at variance with Athens, and enslaved any of her citizens who fell into their hands. He was, however, immediately redeemed by Anniceris, a philosopher of the Cyrenaic sect, who set him at liberty, and refused all repayment of the sum thus expended.

It is not very clear whether Plato had returned to Athens until now, for the course of study and of travels above mentioned, might very well have consumed twelve years, the period which had elapsed since the death of Socrates. Be that as it may, it is certain that he now, if not before, bought a small property; lying without the walls on the northwest, in the part called Cerameicus. This, though a low and unhealthy spot, he planted and beautified, and from the appellation of the neighboring Gymnasium,—the Academy,—the school of philosophy which he established here was usually called the Academic. Here, with the exception of two voyages to Sicily made at the request of the younger Dionysius, he passed the remainder of his life, which closed peaceably at the age of eighty-one.

Plato's works are, or may be in the hands of every

one;\* it is, therefore, not necessary to enter at so great length into his doctrines as from the influence they long had, and perhaps still have in the world, would otherwise have been requisite. One thing must be premised, to prevent his works from being misunderstood by those who may take them up for their own information. Socrates is made to take a large part in these most interesting dialogues, and with such consummate skill is the scene laid, and the actors introduced, that few would suspect that the great teacher of the Academy was only using the name of his old master as a convenient cloak for his own opinions. Doubtful how far the Athenian people might brook his doctrines, and mindful of the fate of Anaxagoras, of Diagoras, of Prodicus,† and of Socrates, he probably thought it expedient to appear to be merely reporting what he had heard. Socrates, justly or not, had paid the penalty of his imagined crime;—were Plato accused, he had but to say, “I am justifying your decree, for here are some of the heterodox opinions of my former master.” A small attention to chronology will make this apparent. The dialogue entitled Protagoras, so full of graphic detail, which has been already noticed, lays the scene at a period when the sons of Pericles were yet living. They died in the great plague 430 B. C., when Plato himself was not born. It is quite impossible that any interlocutor could have reported a conversation held thirty years before, with exactitude enough to enable him to give question and answer with such precision:—at best he must have worked up a

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\* A very elegant French translation, lately published by M. Cousin, places these most delightful writings within the reach even of those who cannot read the original.

† Prodicus is said to have been put to death in the same manner as Socrates. V. Suidas.

general sketch by the aid of his own lively imagination ; but it is more likely that he only made use of this mode of writing, by way of combating the known doctrines of Protagoras, and ridiculing generally the whole race of sophists. Another anachronism may be found in the *Menexenus*. Here Socrates is made to repeat a funeral oration which he professes to have heard from *Aspasia* ; but this oration refers to circumstances which occurred fourteen years after the death of that philosopher. Probably the true state of the case was well known to Plato's cotemporaries, and these anachronisms gave them no concern, because they knew that the names of the interlocutors were only used as a vehicle for conveying the philosophy of the Academy. It would not have been needful to say thus much, had not the notion been very general that we were to look for the doctrines of Socrates in the writings of Plato.

Even the doctrines of Plato himself are not always to be found clearly set forth in his writings, for he seems to have had less of physical courage than his great master, and he has been at considerable pains in those writings which were to be made public, to veil his own opinions under the name of one or other of his interlocutors ; and where he is himself the speaker, as in his "*Laws*," he is exceedingly cautious when he begins to speak on the matter of religion ; requiring the festivals of the Gods to be duly observed, although in his "*Euthyphron*," under the name of Socrates, he had derided the superstitions of the age without mercy. The disguise was but a flimsy one, nevertheless, and he probably owed his safety more to the crestfallen state of the democratic power, than to his own caution ; since a public informer on one occasion is said to have hinted to



him that there was still some of Socrates' hemlock left in the cup.\*

The ridicule cast upon Plato by the comic poets for his gravity, his doctrine of the existence of a soul in man, that would exist after the dissolution of the body, and other Socratic habits and opinions, are among the best proofs that he was a faithful imitator of that excellent man; and refute sufficiently the charges brought against his morals by others, grounded chiefly on some poetry said to be his; but which, if written by him at all, were apparently a part of the early performances which, after hearing Socrates for the first time, he solemnly devoted to the god of fire. His gentleness towards those about him, his temperance, his courage when he believed there was any special duty to be fulfilled, are the best comments on his opinions.

If we may assume the words put in the mouth of the Pythagorean Timæus, to be those of Plato himself, the following is his notion of the origin of the universe. The first thing to be determined, he says, is, what that is which is eternal, and therefore self-existent?—We take cognizance of this by our reason, and we know that it must be unchangeable: by our senses we are made aware of another something which is constantly changing; being born, destroyed, and reproduced: but since what has a beginning must have a cause, this has therefore no existence proper to itself. Thus the material universe must be produced by the Eternal Cause and Father of all things, who is good, intelligent, and almighty; but difficult to be sought out by the wisest even,—incomprehensible to the vulgar. This eternal Father has fashioned the world after a pattern in his

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\* Diog. Laert., lib. iii. § 24.

own thoughts, and considering that nothing is perfectly good without a soul, he has made the universe a living being, having material parts, animated by a divine spirit. All this is still only a refinement on the Orphic doctrine, which, in fact, was but the truth disguised; and as Pythagoras seems to have again made this truth clear to his disciples, it is easily conceivable that Plato, in studying the Pythagorean opinions, found them on the whole satisfactory, and only improved upon them a little for his own school.

In morals he seems to have trod very closely in the steps of his master Socrates, teaching that temperance, justice, submission to the laws, and perfect purity of life, were requisite to form a wise man, and that none but a good man could be a happy one. He appears to have made an effort to spiritualize and purify the passionate love of beauty which prevailed among the Greeks, and thus to reform the general licentiousness of manners: for, according to him, beauty is but the reflection, in the features, of the beautiful soul within: it is to be preserved only by virtuous dispositions, and those who love to contemplate it, should cherish it by cultivating in the object they admire those perfections, which, as life advances, may form the foundation of a lasting friendship. He considered the soul as independent of the body, and held it to be a part of the Divine Spirit which the Creator had enwrapped in matter; its beatification, probably, for that is not quite so clear, he considered to be a re-absorption into the Deity; though in some places, particularly in his *Phædon*, he makes Socrates speak of the happiness of meeting with glorified and happy spirits in another state of being. The proofs, however, which he endeavors to give of the immortality of the soul are weak, so weak that Cicero,

though wishing to believe the doctrine, makes his auditor declare that he found them unsatisfactory.\*

In physics, Plato appears to have embraced the atomic theory of the Pythagorean school; and, late in life, their astronomical views also. Some passages in his *Timæus* would lead us almost to imagine that the Pythagorean doctrine trod close on the heels of modern science. A natural philosopher of our own age could scarcely have been more explicit than Plato, in assuring us that the action of magnetism and electricity, as shown in the loadstone, and amber when excited by friction, was not owing to any peculiar attraction in those substances, but to the movements communicated through contiguous particles under peculiar circumstances. His theory of the nourishment of the body by the affinity of certain particles for each other, and their consequent assimilation, is also in great measure that of modern chemistry; and like modern chemists too he separates the immortal soul from the life of the body. He considers man to be gifted with three souls, i. e., the undying one which survives the body, and is peculiar to man; the mental one which we term the faculties, of which beasts partake in a certain degree; and the purely mortal, which consists in the organic life, which is shared alike by plants and animals.

In politics—for there is no subject which the capacious mind of Plato did not embrace—his views are peculiar and full of interest. He had looked with the eye of a wise and good man on the disorders of the state, and the consequent oppression of the people in his days; and in his “*Republic*,” and his “*Laws*,” he seems to have been endeavoring to discover and point out a remedy. And here

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\* Cic., *Tusc. Quest.*, lib. i., c. 11.

we are at once struck with the inefficiency of all the means which the superstition of those days afforded towards the reform of society. Aware that nothing but national virtue could insure national prosperity, he proposes to eradicate vices by destroying the individual will of the citizen. The Spartans had shown that this was no impossible plan, for the laws of Lycurgus had in great measure effected it during some centuries. Plato proposes to make his citizens merely portions of the body politic: no one was to have liberty to regulate his own life; every hour was to have its employ regulated by law; no possibility of increase of property, no domestic relations were to insulate the citizen from the state: but in this imaginary state of his he forgets what it is which endears his country to man; for it is not an abstract term that can be loved. Even in Lacedæmon natural affection was not wholly trampled on; the mother of the Spartan was his counselor and his guide: the "Return with this, or on it," of the matron arming her son for the battle, when she handed him his shield, is well known: when the unfortunate Agis perished in the endeavor to restore the laws of Lycurgus, his mother and his grandmother shared, and aided in his designs, and fell with him; and generally the women of Laconia played a very different part in society from the rest of their sex in the Grecian states. Probably his increasing respect for the Spartan lawgiver induced him, in his "Laws," to abandon that part of the views advocated in the "Republic," which relates to women, for he here proposes to train them, as in Sparta, to martial exercise, and to give them a share in the affairs of the government, as the means of rendering them virtuous and useful, as well as capable, on a last emergency, of defending themselves and their children

from an invading foe. He proscribes all commerce, as a source of vice; and would insulate the state as far as possible from all others, in order to avoid the danger of contamination; and,—whether to avoid prosecution, or upon the conviction of his own mind, is not certain,—he determines that the views of the philosophic few must not be spread among the multitude, who are still to have their tutelary deities. In this he appears to have varied somewhat from his master Socrates, who conversed with persons of all classes, and endeavored to spread his opinions among the tradesmen and peasants of Attica, no less than among the noble and the rich.

In regard to what is technically called ontology, or the science of what exists;—he considered ideas as a kind of emanation from objects, which thus became matters of sense to us: we having no means of examining the object itself, but only the idea which is impressed on the sensorium: but as these are views which are of little import to matters of common life, it would be foreign to the purpose of this work to enter further into them.

The school of Plato, or as it is more generally termed, of the Academy, was carried on after his death by his nephew Speusippus, a man much inferior to his uncle both in talent and conduct;\* and after him by Xenocrates, whose slow parts had made Plato call him his donkey; but whose unspotted virtue threw into his teaching a persuasive force which was better than brilliancy. There is a pleasing anecdote recorded of this, which, though often repeated, should not be omitted here. One morning—for the school of Xenocrates was open early—whilst the philosopher was lecturing, Polemon, a

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\* Diog. Laert., in vit. Speusipp.

young and gay Athenian, crowned with roses and his robes disordered, was reeling home from a supper party;—he saw the door open, and entered. Of course such a visitor drew all eyes, and Xenocrates, changing his subject, turned his discourse to the beauty of virtue, and the degrading consequences of intemperance. Polemon, who probably came to scoff, remained to listen: gradually his heart was moved;—he stole his hand to his head and removed the garland; presently he composed his robe to a more decent fashion; and by the time the philosopher had finished his lecture, he left the place sobered for ever.\* From that time he emulated Xenocrates in temperance and virtue, and after his death succeeded to his chair in the Academy. One more anecdote of Plato's donkey ere we leave him to the esteem and affection of the good. When called upon to give evidence in some trial, the oath was tendered to him as usual; but the people with one accord exclaimed that it was an insult to tender an oath to him who knew not what untruth was: Xenocrates should not be sworn, for his affirmation was of more worth than the oath of any other man.† To this may be added that, when forming one of a deputation to Philip of Macedon, that monarch declared that Xenocrates was the only one whom he had found inaccessible to a bribe.‡ Whilst the Academy was supported by such teachers, can we wonder at its fame?

The doctrines of Plato remained nearly unaltered in the hands of his immediate successors, but under ARCESILAUS, the friend of CRANTOR, which latter occupied the chair after Polemon, a change was

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\* Val. Max., vi. 9. Diog. Laert., lib. iv., § 16.

† Ib., § 7.

‡ Ib., § 8.

introduced, and the saying of Socrates that his whole wisdom consisted in knowing that he knew nothing, was enlarged into a maxim of the school. The skeptic philosophy of Pyrrhon, who doubted of all things,\* was then gaining celebrity, and the Academy under Arcesilaus seems to have approximated to this sect so far as to deny that man's reason is capable of attaining to complete certainty on any point. The character of Arcesilaus himself probably tended to this change, for far from following the example of his great predecessors, this philosopher disgraced his great talents by a licentious life, and the notion that right and wrong might be a matter of doubt, was a convenient tenet for such a man. He died of a frenzy caused by excessive intoxication, at the age of seventy-five;† and was succeeded by LACYDES, who following in his steps, died of a stroke of palsy from the same cause.‡

CARNEADES made a yet farther innovation on the doctrines of Plato; and held that all truth had a certain degree of error attached to it so intimately, and resembling it so closely, that there was no certain method for deciding between them; on which account a full assent to any opinion should be withheld. Cicero, who appears to have admired the writings of Carneades, and the doctrines of the Academy as taught by him, and afterwards by Antiochus, tells us that the object of this suspension of judgment was, to elicit the truth by calm discussion; to show, e. g., not that the gods did not exist, but that the

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\* This philosopher was so serious in his doubts of the reality of things, that he never turned aside to avoid any obstacle, be it what it might, and was only saved from danger by his more sane friends, who, knowing his fancy, were wont to follow him in his walks. Diog. Laert., lib. ix. § 62.

† Diog. Laert., lib. iv. § 44.

‡ Ib., § 61.

stoics had not proved that they did:\* a system which Cicero follows up himself in his philosophical treatises where he gives the tenets of the different schools, and points out the weak parts in their arguments with much impartiality. In morals Carneades taught that the ultimate end of existence was "to enjoy natural principles,"† a phrase so obscure that it makes any further discussion of his doctrine on this head quite hopeless. He was a man of acute perceptions, and a clever lecturer and disputant;‡ but Greek Philosophy was no longer what it had been in the hands of its earlier teachers. It was now mixed up with the arts of the sophists, and had lost the earnestness and reality given to it by men who look to great objects, and who, instead of aiming merely at a reputation for cleverness, sought to confer a lasting benefit on mankind.

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\* Cic. de Nat. Deor., l. i. c. 2.

† Frui principiis naturalibus. Cic. de Fin., l. ii. c. 11.

‡ Diog. Laert. in vit. Carn.



#### IV.

### THE CYRENAIC AND CYNIC SECTS.

Two other schools of philosophy, if they may so be called, arose after the death of Socrates: the Cyrenaic and the Cynic. At the head of the first was Aristippus, a hearer, but hardly to be called a disciple of the martyred sage. He was a man of luxurious habits,\* and taught that sensual pleasure was the great object of life: but human nature loves not degradation, and this part of his system scarcely outlived him, but gave way to the tenet, that comfort was the great object of existence, and that, therefore, when life was become a source of uneasiness, it was well to quit it. Perhaps this alteration in the Cyrenaic doctrine may have been owing to Arete, the daughter of Aristippus, who became a philosophical teacher, and was the instructor of her son, distinguished from his grandfather of the same name by the *sobriquet* of μητροδιδαστος,—mother-taught. As the Cyrenaic school soon sunk into obscurity, or rather was merged in the more flourishing one of Epicurus, it will not be needful to give a longer notice of it here.

The Cynic sect, so called from the Cynosargos, a gymnasium where its first professors used to teach, was founded by Antisthenes, a devoted disciple of Socrates, who was wont every day to walk from Peiræus, where he resided, in order to listen to that excellent man's lessons of wisdom. After the death

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\* See Xenoph. Mem., l. ii. c. 1. Diog. Laert. in vit. Aristippi.

of his admired master, Antisthenes betook himself to a life of extraordinary and ostentatious austerity; and setting at nought the ordinary comforts of life, devoted himself wholly to the reproof of vice and luxury, in one of the most vicious and luxurious cities of antiquity. Among other of his severe taunts, it is recorded that some young men from Pontus, having come to Athens, attracted by the fame of Socrates, just when that philosopher had suffered death; he assured them he would show them a wiser man than him whom they sought, and led them to Anytus the prosecutor, who was forced to take to flight before the indignation thus excited against him.\*

DIOGENES of Sinope—whose name has become famous, and almost infamous, from a variety of lying tales, readily enough devised and repeated by those who wished to crush the daring of the philosophic party, or dreaded the stern morality it taught—was the scholar of Antisthenes, and so determined to be so, that when this latter, not wishing for pupils, treated him with harshness, and even threatened him with his staff, he replied, that “he would find no staff hard enough to drive him away;” and the stern Cynic was moved at last to receive him. Every one has heard of the tub of Diogenes, of his reply to Alexander, and of that monarch’s observation in consequence; yet it appears probable that these are all fables of the same cast with the impurities attributed to the Cynics, whose extreme severity of life, joined to their contempt of all sensuality, gives the lie to the slander.† Diogenes is recorded to have been taken by pirates during a voyage, and sold in

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\* Diog. Laert., lib. vi. § 10.

† For a farther examination into the chronological discrepancies which refute these tales, see Brucker’s *Hist. Crit. Phil., De Secta Cynica*.

the slave market in Crete, where he was bought by Xenocrates, a Corinthian, who, when he had taken him home, finding him to be no ordinary man, set him free, and employed him as tutor to his children; in which capacity Diogenes acquitted himself so conscientiously, that Xenocrates is said to have blessed the day that brought such a friend into his house.

Among the scholars of Diogenes, CRATES, a Theban, was the most famous: a man so highly respected, that he was the general composer of differences throughout Athens.\* Of him, too, and his wife Hipparchia, many tales have been told, which are refuted by the general character of the man: they originated probably in the same causes which had subjected every one to slander whose life and doctrines ran counter to the general licentiousness, and who did not join in the prevailing superstition. Libertines hated the stern censor of vice;—the people dreaded the loss of the sacrifices and the Dionysia.

The Cynic sect appears rather to have instituted an especial mode of life, than a philosophical system; it was in fact, the mendicant order of philosophy; and, like the mendicant orders of the Christian church, and all other ascetics who require a severity of life which nature opposes, after the first enthusiasm was over, its professors degenerated, till in later times they became justly infamous. Crates was the master of Zeno of Cittium, the founder of the Stoics.

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\* Brucker, *Hist. Crit. Phil.*, Pars II. lib. II. c. 8.

## V.

### ARISTOTELES AND THE PERIPATETICS.

B. C. 335 TO — ?

AMONG the pupils of Plato, about the same time that Xenocrates was learning to grace his slow parts with the higher beauty of moral virtue, another young man was seen, whose disposition and appearance were the reverse of the other in all but that last, best ornament of man, the love of virtue. **ARISTOTELES**, the son of a physician of Stagira, a small town on the borders of Macedon, but then an orphan, and the inheritor of a large fortune,—at seventeen years of age entered the Academy. His talents soon attracted the notice of his discerning master, who, having jestingly compared the slow mental pace of Xenocrates to that of an ass, always needing the spur; now likened the acuteness of Aristoteles to the headlong speed of a horse, which requires a bridle to prevent him from running away.\* He was of slight form and weak constitution, and was noted by his contemporaries for a more than ordinary attention to dress and ornament: but none of these things were any hindrance to his eager pursuit of science, which ceased not but with his life. During twenty years he was the pupil and friend of Plato, who was wont to call him “the mind of the Academy,” and if he was not present, would exclaim, that “the audience was deaf, for the intellect was absent.”†

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\* Diog. Laert., lib. iv. § 6.

† Brucker, Hist. Crit. Phil., Pars II. lib. ii. c. 7.

The connection of the young student's father, Nicomachus, with the court of Macedon, as physician to the king, probably led to the notice bestowed upon him by Philip, who, on the birth of his son Alexander, is said to have written to Aristoteles, informing him of the fact; and adding, "we thank the gods for their gift, but especially for bestowing it at the time when Aristoteles lives; assuring ourselves, that educated by you he will be worthy of us, and worthy of inheriting our kingdom."\* It does not, however, appear that this letter, if indeed it be genuine, drew him away from Athens; for he did not commence his duties as preceptor until fourteen years after.

When Speusippus succeeded to the chair of the Academy, after the death of his uncle Plato, Aristoteles quitted Athens; disgusted, probably, at seeing the place of his admired master very inadequately filled. One of his fellow-pupils and friends had been Hermeias, a eunuch, and once a slave; but now raised to the sovereignty of Assus and Atarneus, two Greek cities of Mysia. In the latter of these cities Aristoteles had passed some part of his youth, in the family of Proxenus, a citizen of that place; and as we find Nicanor the son of Proxenus afterwards adopted by him, and made the heir of his property, so it is likely that motives of gratitude as well as friendship led him thither. The seizure and execution of Hermeias by the officers of Artaxerxes, made Aristoteles think it needful to provide for his own safety: he fled to Mitylene, in the island of Lesbos; taking with him Pythias, the kinswoman of Hermeias, whom he there married. He passed two years in Lesbos, and here his wife died, leaving him an infant daughter. It was her dying wish that her bones might be placed

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\* Aulus Gellius, cited by Gillies.

beside those of her husband in the grave, and at his death, her request was scrupulously fulfilled.

The wish of the Macedonian monarch that Aristoteles should undertake the education of his son, was probably now reiterated; for, shortly after, he journeyed to the court of Philip, and became the honored preceptor of the young Alexander. During eight years he executed the office with a care and success which made his pupil the wonder of his own, and after ages: and, on the accession of that prince to the throne, he once more returned to Athens; where, finding Xenocrates in possession of the Academy, he opened a school of philosophy in a gymnasium near the temple of the Lycian Apollo in the suburbs, and thence called the Lyceum; and here, during thirteen years, he continued to teach his exact and profound philosophy. Whilst Alexander lived, his preceptor was respected; but no sooner had death closed the career of that great monarch, than the kind of accusations formerly made against Socrates, were renewed against Aristoteles: the doctrines of his school were too pure for the prevailing corruption, and a prosecution was commenced against him; which, however, he avoided by removing to Chalcis in Eubœa, saying that he was unwilling to afford the Athenians a second opportunity of sinning against philosophy. He did not long survive his voluntary banishment, and died at Chalcis, in his sixty-third year, about a year after.\*

The followers of Aristoteles were termed Peripatetics; either, as some say, from his habit of conveying his lessons to his royal pupil in conversation while walking; or because his lectures in the Lyceum

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\* For a more detailed account of this philosopher, see his life, prefixed to Dr. Gillies' translation of his *Ethics and Politics*.

were so delivered. His writings have come down to us in a very imperfect state; for after having passed into the hands of his scholar Theophrastus, with the rest of his library, they were left by that philosopher in turn to his own pupil Neleus, who, carrying the whole with him to Scepsis, a town of Troas, left this most valuable collection to his heirs, with his other property. These, being unlettered men, knew not the value of this bequest, but hearing that the King of Pergamus was collecting a library, and fearing that they should be robbed of their books, they concealed them in a dark vault, where they remained undiscovered for many generations; till at last they were sold for a large sum to Appellicon of Athens, whose library was seized and transmitted to Rome by Sylla, when that city fell into his hands. At Rome, in the days of Cicero, the writings of Aristoteles could be appreciated; and Andronicus of Rhodes, a philosopher then residing there, undertook the task of editing them in the best manner which their mutilated state permitted:\* for it appears that it was only a *copy* of the original which Sylla had possessed himself of. Probably the original had been too far decayed when it came into the hands of Appellicon, to invite its preservation; for Strabo observes that he was a book collector merely, not a philosopher.

The writings of Aristoteles appear originally to have embraced the whole round of human knowledge in those days, but neither the military power of Rome nor the sway of the emperors was favorable to the progress of philosophy, and Christianity soon raised itself on the ruins of all three; and, when, after the period of harassing warfare and barbarian invasion

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\* Plutarch, in vit. Syllæ.

had passed away, his works were re-discovered in later times; his logic won the most attention. In this he reduced argument to a regular form; and though we may now doubt if this form be so widely applicable as was at first supposed, no one can deny its excellence as a mental exercise; for nothing better shows the absurdity of a false argument than a syllogism;\* and though upwards of two thousand years have elapsed since their death, we have not yet found a better guide in the art of reasoning than Aristoteles, or in mathematics than Euclides:—no small praise to the old philosophers of Greece.

Like Cicero in after times, he addressed his chief work on moral duties to his son Nicomachus, the fruit of a second marriage, who seems to have been a child when his father died. Like the great Roman moralist, too, his precepts, being founded on the immutable law of God, written in man's heart from the beginning, have a striking resemblance, or rather, are in many cases identical with those of Christianity. The following rule for judging of our proficiency in virtue is such as Christ himself might have spoken. "The sign of our habitual state of mind," says he, "is the pleasure or pain which we have in our actions: he who withdraws from corporeal pleasures with a feeling of satisfaction in so doing, is really and

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\* A syllogism is the result of an argument, condensed into two propositions, called the major and the minor, and the conclusion resulting from them. As "God is self-existent, but what is self-existent must be one, therefore God is one." Here we have the last result of a long series of argument, brought before us in a brief and tangible form, and if either the one proposition or the other can be impugned, it vitiates the conclusion. An argument, therefore, may be reduced to a series of syllogisms; for every fresh step made, admits of being reduced to this form. Those who wish to know more of the abstruser works of Aristoteles, will find an able analysis of them in Dr. Gillies' work already referred to.



wisely temperate; he who does so, but grieves at it, is still a voluptuary at heart."\* It would be impossible in this small work to quote abundance of passages which breathe no less admirable sentiments: it will be easier to point out the very few points where the heathen falls behind the Christian moralist. With regard to the immortality of the soul he seems to have entertained less clear notions than Plato even, and was far behind Socrates: his idea of liberality is of habits bordering on ostentation; and his estimate of slaves, whom he calls merely "living tools," and of women, whom he places not many degrees beyond them, is far, far indeed below that of the Apostle who proclaims that before God "there is neither male nor female, bond nor free." Yet we can hardly blame the heathen, without throwing a quadruple load on the shoulders of the so-called Christian of modern times, who, with all the light of that Gospel which eighteen hundred years ago preached peace and good-will to the whole human race, has still left many a pariah caste, uncared for by the laws, or marked only by their stinging severity.

In his Politics, Aristoteles is far more practical than Plato, whose notions on government he criticises with much good sense. But his own views are not unobjectionable; and the faults in his Ethics, already mentioned, show themselves with double force when the abstract notion takes form and likelihood in the regulation of a state. Acknowledging that the slave population formed the weak point in every country that he was acquainted with; acknowledging that for the most part they were the natural enemies of their lords; he does not seem to have been able to discover that such a system must

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\* Aristot. Eth. ad Nichom., lib. ii. c. 2.

be radically bad. On the contrary, imputing the faults of slaves to their kind of employment, he forbids his citizens to undertake any industrial labors; thus perpetuating, as far as in him lay, a system of idle tyrants, supported by the industry of numerous enemies, kept within the bounds of obedience only by severity. Yet his clear and argumentative mind saw the contradictions in reasoning which his own system involved, and he states them fairly. "If," he says, "a slave be capable of any virtues, wherein does he differ from a free man? If we say he is not, and yet allow him to be a man, and consequently endued with reason, the conclusion seems absurd. The same difficulty occurs with regard to women and children: and yet how can one party be formed to obey and the other to rule, if both are by nature capable of the same virtues?"\* Yet though seeing the absurdity, prejudice prevailed over reason, even in his powerful mind, and he concludes at last, that slaves, women, and children, are incapable of the virtues, which, in their capacity of man, generically, he had already acknowledged to form part of their very nature. A weakness hardly to have been expected from the inventor of the syllogism.

In his natural philosophy he falls behind some of the older philosophers of Greece, and argues against their opinions in a way that was scarcely to be expected from a man of his acute perceptions: but he seems to have bewildered himself in his own logic, which, though it detects the fallacies of an argument when there are right premises to go upon, does not suffice if these are wanting. Thus, he conceives that he refutes Thales' opinion, that "the earth floats in the air as a piece of wood does in the water,"—

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\* Polit., lib. i. c. 8.

by saying, that "the earth is specifically heavier than the air, and, therefore, it cannot so float:"\* and he endeavors to overthrow the opinion of Pythagoras, that the centre is occupied by a globe of fire, round which the planets move; by showing that the power of gravitation acts in angles which meet in the centre of the earth, and this he takes as a proof that the earth is the centre of all things.† He comments severely on the atomic system of the Ionian and Italian schools, insisting that everything, even if not actually so divided, is capable of division ad infinitum; and in every one of the above cases he brings forward a show of close argument, vitiated only by his ignorance of first principles, which, whilst devoting his attention to the forms of reasoning, he seems to have overlooked. In this respect he must yield to Democritus, who, after a life devoted to experimental philosophy, found out that his chief science consisted in knowing that he had not yet reached, nor could hope to reach **THE TRUTH**.

On the subject of the soul he confesses himself to be at a loss; yet on this point his reasoning is in many parts just. Probably on points where human reason can never arrive at perfect certainty, he who sets off by seeking an approximation only, by rejecting error after error as it fails to bear the test of rational inquiry, will approach nearer to it than he who sets off with the notion that he can reach at once the whole depth and height of knowledge; a position which no human intellect ever yet attained. It is to the scarcely embodied conceptions of some great mind, expressed in the modest language of doubt, that the next age commonly owes its discoveries, experimented upon and proved by men much

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\* De Cælo, lib. ii. c. 13.

† *Ib.*, c. 14.

inferior to him who but dimly saw the form of truth in the distance, and pointed to the glorious vision. Thus it is that Anaxagoras, who only directed men's eyes towards the right point, was nearer to the truth, in many instances, than Aristoteles, who submitted the sublime conceptions of his predecessor to what he conceived to be logical and mathematical demonstration; forgetting that he himself had not sufficient facts to ground his arguments upon. He has, however, rightly exposed the error of those who conceived the soul to be the cause of motion; for this, he says, is common to the lowest grades of animals as well as the highest, and it would be a daring stretch of imagination which would give a soul to an oyster: he has rightly shown that in plants even, there is vegetative life, and concludes, therefore, that the human soul must be something apart from this vegetative and sensitive life: but the defective state of anatomical science here stopped him short, and in his farther progress he argues on false premises. Finally, having come to the conclusion, that the soul is as distinct from the body as the sight is from the pupil of the eye\*—an immeasurable distinction *then*, when the properties of the nerves were not known—he leaves the great question, which is the first and the last with every thinking man, unanswered. Whether the soul is, or is not immortal, was felt, not argued by the elder sages; and their feelings led them right, even when their reasonings carried no weight.

It would be vain to attempt to follow the extensive researches of the great Stagirite in the compass of a few pages. Those who are able to read his works will find their labor well rewarded; those who are

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\* De Anim., lib. ii. c. 1.

not, will at least here learn to give due honor to one of those master minds that are sent into the world from time to time, to influence the destiny of their fellow men.

## VI.

### ZENO AND THE STOICS.

B. C. 310? TO — ?

ZENO, whose name has long been famous as the founder of the Stoic sect of philosophy, was the son of a rich merchant of Cittieum, a Phœnician colony in the island of Cyprus. He is said to have devoted his attention to the Socratean doctrines very early; but his future fame as the head of a sect was probably the result of an accident. He put to sea with a cargo for Athens, and either landed, or was shipwrecked off Peiræus. On going into the town he entered a bookseller's shop, and taking up the second book of Xenophon's *Memorabilia*, after a short time he was so struck with it, that he asked the bookseller where such men were to be found now? At that moment, Crates the Cynic was passing, and the man pointed to him, and bade the stranger ask him, if he wished to know. Zeno took the bookseller's hint, and became a disciple of Crates: but there was something so revolting in the utter contempt for all the lesser decencies of life which formed a part of the Cynic's doctrine, that he never could entirely reconcile himself to their discipline; and Crates having taken rough measures to cure him of his squeamishness,\* his scholar forsook him in disgust, and

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\* He gave him an earthen pot of boiled lentils to carry through the Cerameicus: which was like sending a gentleman in our own days, on such an errand, past the club houses in Pall Mall and St. James' Street. Zeno strove to hide the pan under his

became a pupil of Stilpo the Megarian, who was either a disciple of Euclides, the assiduous hearer of Socrates, or at least belonged to that school. Stilpo, like most of those who had imbibed the Socratean doctrines, despised the polytheism and idolatry of the age, and one day unguardedly expressed his opinion that the *statue* of Minerva was not a god: for this he was cited before the Areopagus, and though he defended himself in the only way that such a charge could be met, by saying that he had spoken truly, for according to their own showing it was not a *god* but a *goddess*, he could not escape banishment from Athens for his irreverence. It was probably in consequence of his leaving the place, that Zeno, after having remained ten years in his school,\* sought a new master in the Academy, where Polemon then presided.

Having thus prepared himself by studying under all the most famous masters for many years, he at length undertook to found a new sect himself; and as all the usual places of philosophical resort were already occupied, he took possession of the party-colored colonnade or Stoa, so termed from the paintings which decorated its walls. From this place of meeting his followers were called Stoics. Here he taught what he wished to be considered as a new system; yet as his predecessors had, in most things, approached very near the truth, there was not much room for novelty, and Cicero expressly asserts that Zeno was rather an inventor of new terms, than a discoverer of new things;† and professes himself

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robe; which Crates seeing, broke it with his stick; so that the pottage ran down the legs of his mortified scholar. Diog. Laert., lib. vii. § 3.

\* Diog. Laert., lib. vii. § 2.

† Cic. de Fin., lib. iii. c. 2.

unable to find any good reason why he should have dissented from the early masters of the Academy.\*

In his life, this philosopher was self-denying† and unostentatious; and the severe observations which have been made upon this sect were probably more deserved by his successors than himself. It is a fault of judgment when we impute to any man opinions which do not square with his life; for it is much more possible that he may express himself ill, or that we may misunderstand him, than that what is truly believed should not influence the conduct. If, therefore, we can draw immoral or false consequences from a doctrine, which are not discoverable in the life of the first promulgator, it is quite clear that *he* did not perceive those consequences; and we may question his logic, but not his intention. "By their fruits ye shall know them," was the rule of ONE who assuredly knew human nature well. Whatever, then, were the contradictions and false consequences in the doctrines of Zeno, it is most probable that his own mind was influenced by the sublimer part of them; and that he had overlooked those discrepancies which were so much animadverted on by his opponents. Few of the philosophers of antiquity had the excellent judgment of Socrates, who, measuring justly in his own capacious mind the defective state of the natural sciences in his age, at once abandoned the study as affording no chance of arriving at the truth,—professed that his knowledge consisted in knowing his own ignorance, and enforced nothing but what, thanks to the very con-

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\* Cic. de Fin., lib. iv. c. 2.

† It became a proverbial expression to describe a man of singularly correct and abstemious life, to say that he was "more temperate than Zeno the philosopher." Diog. Laert., lib. vii. § 27.



stitution of nature,—must be discovered by every deep thinker: *i. e.*, the existence of a First Cause, and the duties and hopes resulting from this one piece of true science. Had Zeno stopped here, his teaching would have been more useful, and not open to animadversion; but he lost himself in the mazes of natural philosophy, whilst endeavoring to tell more than he knew. In the first steps of his system there is a wonderful resemblance to the Hebrew doctrine, which some of the early Christian Fathers assert Plato to have borrowed from Moses,\* and which Zeno appears to have taken from Plato; for he evidently was unable to reason logically upon it himself.

According to Zeno, then, “There is One God, Mind, Fate, or Jove, known also by other names. This God in the beginning, being alone and self-existing, changed the substance of the air into water, and as the living seed is contained in the fœtus, so he, being the life-giving and efficient reason (*λογος*) of the world, placed his Spirit in the waters to be the cause of the generation of all things; and thus were created the four elements, out of which all things were made, and into which they will again be resolved.”† We next find him arguing, that the world, or universe, is itself the only Deity, upon the following very insufficient and illogical grounds. “Whatever is possessed of reason is better than what is not possessed of reason:—there is nothing better than the world, therefore the world is possessed of reason. In the same manner it may be proved that the world is wise, and eternal; for what is possessed of these qualities is better than what is

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\* See Clem. Alex. Strom. passim.

† Diog. Laert., lib. vii. § 136.

not possessed of them ;—but there is nothing better than the world, hence it is clear that the world is God.”\* The man who was unable to discern such palpable contradictions as the above in his own tenets, must have been strangely wanting in logical precision : and accordingly we find the same illogical conclusions, mixed with noble thoughts occasionally, throughout the Stoical system. In some parts the Orphic doctrine is revived in its worst form, as when it is asserted that God, being in all things, these things may be venerated and worshiped as gods,† and thus such deifications as fortune, honor, fear, &c., may be allowed ; nay, even vices may be thus worshiped, as effecting some good purpose in the world.

It is not easy to follow arguments so utterly inconsequential as those of the Stoic philosophy : it may, therefore, suffice to say, that the stars, sun, moon, &c., are held to be self-moved deities : that Providence is only a term to express the rational foresight of these revolving beings, and that to talk of any existing Providence, exterior to them, would be like supposing the Athenian state to have a government when the people were taken away :‡ that the universe is God :§ and then, in defiance of all consistency, we find : “God, who is the maker of all things, and has formed them from his own existence, who after a time dissolves, and again re-makes them, is self-existent and incorruptible||—God being eternal has created all things¶—God is an immortal being, rational, perfect ; ruling the universe and all things in it, as the Maker and Father of all : but he

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\* Cic. de Nat. Deor., lib. ii. c. 8.

† Ib., c. 29.

§ Diog. Laert., lib. vii. § 148.

|| Ib., § 137.

‡ Ib.

¶ Ib., § 134.

is not in human form.”\* That acute men, as many of the Stoics are known to have been, should have gone on uttering such contradictions for three or four centuries, appears almost unaccountable: one lesson, however, it may teach us, which is not altogether needless at any time: it shows the power of prejudice on minds otherwise cultivated, and is a good instance of the danger of receiving dogmas upon authority, without examination.

The moral doctrines of the Stoics are better known than their theology and physics. They taught that the great object, *τέλος*, of man's existence, was, to live according to the tendencies of his nature; these being exhibited in the instinctive affection towards offspring, social ties, &c.; and the duties springing out of such relations were considered as forming part of these tendencies. Reason being the noblest part of our nature, this of course claimed the most regard, and he who lived according to reason, giving due attention to the duties springing from the tendencies of our nature, was a happy man. If, then, happiness consists in living virtuously, there can be no pain but that of living viciously; therefore bodily pain is no evil; and the virtuous man on some occasions sets it at nought, and finds pleasure in so doing. But the Stoic's virtuous man had no inducement to virtue: he was not promised immortality, for the soul was held to be of corruptible materials, and Zeno himself is said to have considered it merely as a warm breath.\* The high motive given by the teachers of the Academy, and the great men who preceded them, was therefore wholly wanting; and the Stoic who called on men to set pleasure at

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\* Diog. Laert., lib. vii. § 147.

† *Ib.*, § 157.

nought, and spent a life of painful sacrifices, could neither offer any sufficient compensation, nor plead the innate dignity of the undying soul; nay, could only have gained converts at all in consequence of an instinctive feeling of things which they either disavowed, or perplexed, in their system of philosophy. It offered no complete solution of the great problem of man's existence; but the mind caught at the one great principle of the Eternal Maker of all things, alone in his might and his goodness, and *felt* the consequences of this one tenet even whilst denying them.

Among the slanders heaped on each other by the rival sects of Stoics and Epicureans, it is not easy to distinguish the truth; but by the rule already laid down, as the lives of the two founders of these famous sects were equally virtuous, though their dispositions were different, we shall probably be nearest the truth by disregarding both. One tenet, however, which is imputed to Zeno and his followers, seems in some degree proved by the conduct of Cato,\* one of the most famed of the Stoic sect. They are said to have taken the doctrine of a community of women from Plato's most visionary work, the "Republic;" which even his own better sense rejected in his later work on the same subject, *i. e.*, his "Laws." It was only in times when females were so lowered from their human dignity by ignorance, as to be viewed in the light of a property merely, that such a doctrine could have found place: but when such a man as Plato could so speculate,—when such a man as Aristoteles could doubt that women and slaves were *capable* of rational and virtuous conduct, it is not wonderful that Zeno, never an ori-

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\* See Plutarch's Life of Cato of Utica.

ginal thinker, should have been led away by their example.

In anatomy the Stoics seem to have made some progress,\* and to have made a good use of it, by arguing the existence of the Deity from the curious contrivances in the construction of man's body. The nerves, however, are by them supposed to originate in the heart, which shows that they must have traced their course very carelessly. It is from this ancient notion, probably, that we derive the expression so common still, of—"I have not the heart to do it."—The course of the blood seems to have been tolerably well understood: so well, that it is not very clear why its circulation should not have been so also.

The astronomy of the Stoics partook of all the faults of the times; and of their logic and mode of arguing a sufficient specimen has been given. In manners they affected much of the severity of the Cynics, though they seasoned it with more of gravity and decorum; and, to pursue the comparison with later times, if the Cynics were the mendicant order, we may reckon the Stoics the Quakers of philosophy.

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\* Cic. de Nat. Deor., lib. ii. c. 55.

## VII.

### EPICURUS AND HIS SCHOOL.

B. C. 307 TO — ?

ZENO had not been long established as the founder of a new sect, when another teacher made his appearance at Athens, whose doctrines were destined to have a larger and longer influence in the world than could have been expected from his parentage and education. EPICURUS was the son of Neocles, an Athenian of good family,\* but much reduced in circumstances, who had, in consequence, joined the colonists who were sent to Samos after that country had submitted to the arms of Athens in the time of Pericles. It was in the birthplace of Pythagoras, therefore, that the young Epicurus received his first instruction. This, however, amounted to but little, for his mother was reduced by their poverty to go from house to house as a dealer in lustrations and charms, and in these expeditions the boy accompanied her, in order to read the lustratory verses; at other times he assisted his father in the humble business of a schoolmaster. The accidental reading of some of Democritus' treatises is said to have first given him a taste for philosophy.

At eighteen years of age he visited Athens, but whether he profited by the opportunity thus afforded him of enjoying the instruction of Xenocrates, or of

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\* Diog. Laert., lib. x. § 1. Peisistratus had sprung from the same stock. See Plutarch in Solone.

Aristoteles, then established at Chalcis in Eubœa, is very uncertain : he is said in after times to have declared that he was self-taught.\* The distracted state of political affairs after the death of Alexander, drove him from Athens, and, four or five years after his departure from Samos, he joined his father at Colophon, in Ionia.† Here he remained nearly ten years, after which he passed his time partly at Mitylene, and partly at Lampsacus, till, at the age of thirty-five, or as some say, thirty-seven, he returned to Athens, now restored to freedom by Demetrius Poliorcetes, and having purchased a house and garden for eighty minæ,‡ he there opened his school of philosophy. Some friends and disciples seem to have followed him from Lampsacus, and other places; among these Metrodorus was the chief; and they, with some others, seemed to have formed a little society, congregated under the roof of their teacher; whose manners had something so captivating, that his pupils adored, rather than learned of him. Of Metrodorus it is recorded that he had never quitted him but once, and that only for six months, in order to revisit his friends at Lampsacus. Epicurus rewarded his faithful attachment by as faithful a friendship, for Metrodorus dying seven years before his teacher, this latter took the charge of his children, and provided for them in his will.†

It is probable that the disgust which the habits of the Cynics, and the sternness of the Stoic philosophy caused to the gentle nature and weak health of Epicurus, first led him to review the systems which had sprung up before and since the death of Socrates.

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\* Diog. Laert., lib. x. § 11.

† See Gassend., *De Vit. et Mor. Epicuri.*

‡ About £320 of modern English money.

§ Diog. Laert., § lib. x. §§ 19, 20. 23.

He is said to have passed over the later ones, as less worth his notice, and to have returned with especial respect to that of Anaxagoras and his pupil Archelaus; so that he may be considered as a pupil both of the Italian and Ionic schools, though in many things differing from both. From the Ionic and Pythagorean sects he took the atomic doctrine, adhering, however, most to that form of it which was taught by Democritus, whose books he lectured from: \*—from the Cyrenaic sect he borrowed the tenet, that the object of life was pleasure, which he purified at the same time, by specifying that it was *mental* pleasure that he intended; and from Anaxagoras and Socrates he seems to have taken the high tone of morality, † and the disregard for the vulgar superstitions, which distinguish his writings, of which, however, the larger part has unfortunately perished.

The Stoics, jealous of the new teacher, whose doctrines and conduct had much of the gentleness which afterwards characterized Christianity, set themselves in illiberal opposition to him, and endeavored, by slandering his private conduct, to throw discredit on his tenets. They affected to consider his doctrine, that "pleasure is the summum bonum, pain the great evil of man," as one of immoral tendency; and without regarding his real doctrine, or his real life, they represented the little society assembled in his pleasant house and garden, as a set of worthless debauchees and courtesans, and the teacher himself as the leader in every kind of licentiousness. In order to give color to these representations they forged letters of the most infamous description, which were ascribed to him and his friends; ‡ and others have come down to

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\* Diog. Laert., lib. x. § 4.

† In his letter to Menæceus. Diog. Laert., lib. x.

‡ Diog. Laert., lib. x. § 3.



us, which, though not particularized as forged, bear such internal marks of falsehood in their disagreement with known dates, that we may safely add them to the list of the calumnies invented by the opponents of his philosophy, in order to throw discredit on the captivating teacher who thinned the numbers in their schools, by attracting them to his own.

It is worthy of remark that every system of philosophy which arose in Greece, found converts among the female sex also, notwithstanding the hindrances thrown in their way by the prejudices of society, and the ignorance in which that sex was kept by the domestic usages of the country. It is not very creditable to human nature that then and there, as well as till very lately in England, almost every woman who stepped beyond the littlenesses of life, so as to fit herself for the greater duties which fall to her lot as a citizen of the state, was made the object of scorn and calumny by a large portion of both sexes. The minds which could surmount such obstacles must therefore have been of no ordinary calibre, and their cowardly enemies had tact enough to know that it was useless to deny the talent which they envied; but it is easy to whisper away the purity of a woman's reputation, and this plan was pursued with unusual success. The consequence has been that names too famous in science and literature to be forgotten, have come down to us with the slander of those days so closely attached to them, that it requires all the acuteness of criticism to separate truth from falsehood, and do justice to these much maligned persons. Every one has repeated the tale of the wonderful learning of the courtesans of Ionia and of Athens:—few have taken the pains to consider that the two characters are incompatible both physically and morally; and still fewer have examined remaining records enough

to show by comparison of dates and circumstances, that certainly some of these celebrated women, and most probably all, were but the victims of a kind of ill-nature which even in this age is not wholly unknown.

Among the disciples of Epicurus were many females, some of them the wives of the philosopher's friends, as Themista, whose learning became proverbial; and others, perhaps students under them, who devoted themselves to science, as Leontium, Philænis, &c., who were stigmatized by the unscrupulous Stoics, as women of light character; and supposititious letters and writings were attributed to them in order to support the slander.\* Yet Leontium is recorded to have written elegantly and learnedly against Theophrastus;† no light undertaking, and one not to be accomplished by a person whose time was devoted to other occupations so incompatible with severe study. Even the persons who have been so ready to report the accusations of licentiousness and gluttony against Epicurus and his pupils, have contradicted themselves, often in the same page, by noticing the frugal diet of the philosopher and his friends, their close application to study, and the continually increasing infirmity of health, which kept the former for many years a prisoner in his bed, from which he could not rise without assistance. His request to a friend to send him some "cheese to add to his bread occasionally, when he was inclined to fare sumptuously,"‡ shows sufficiently what were the delicacies which he was accused of setting daily on his table.

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\* Gassend. de Vit. et Mor. Epicuri, lib. i. c. 8. Athen., lviii. 13.

† Cic. de Nat. Deor., lib. i. c. 33.

‡ Diog. Laert., lib. x., § 10.

It is not pleasant to trace and detect such a course of malignant slander; but it is no more than a duty which every historian owes to calumniated individuals; for were the judgment of posterity always to conform to the prejudices of cotemporaries, the motives for well-doing would, in many, be considerably lessened: among such, at least, as consider an honest fame in this world as one of the rewards of a life spent in the performance of sometimes painful duties. It is still more unpleasant to find cotemporary prejudices carried on through successive generations, and repeated by such men as Cicero, whose acute mind and habits of pleading ought to have led him to detect the truth. Yet even he, while repeating the often told slanders, is obliged to confess that the death of Epicurus was marked by a calmness and patience amid the severest sufferings, more heroic even than the self-sacrifice of Leonidas, or the fortitude of Epaminondas.\* The gentle and affectionate disposition of the man is shown in his will, when he makes provision for the orphan children of his friend Metrodorus, and appoints guardians for them from among his other disciples; to this he adds a request that his friends would meet once a month in memory of him, and leaves funds for defraying the expense of the entertainment. His pleasant little residence he left to Hermachus, one of his disciples, and to his successors in the philosophical chair.

No teacher ever enjoyed so long and affectionate a remembrance among his disciples as Epicurus. In the time of Cicero the ornament of cups, the impress of seals, the pictures in the hall of entertainment still represented the features of the honored founder of

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\* Cic. de Fin., lib. ii. c. 30.

the sect in the houses of his followers,\* and the name and observance only became obsolete when all philosophical sects merged in the one great rule of Christianity which this school closely resembled in many of its precepts.

The Epicurean philosophy has been chiefly famed on account of its tenets with regard to the material universe. Epicurus received his earliest impressions in science from the works of Democritus, and there was much in the writings of that naturalist which must have been fascinating to a young mind. He adopted his views with regard to the eternity of matter, the infinitely numerous atoms† of which, eternally moving and floating in an infinite vacuum, form, by their concretion, the different bodies of the material universe. These bodies, when dissolved, return to their primary atoms, but the sum of matter remains unchanged; it always has been and always will be the same.‡

According to him there are three criteria of truth, *i. e.*, sense; anticipation (*πρόληψις*); and emotion (*πάθος*). Sense is the proper judge of material things, for, being wholly unreasoning, it can have no motive for deceiving us, and reports truly what it is conscious of: *πρόληψις, i. e.*, the seizing on beforehand, is that comprehension by which unseen things have their representatives in the mind, as in memory, or abstract ideas of things; *πάθος, i. e.*, whatever is passively endured, may be reduced to two heads,—pleasure and pain. But beyond the actuality of body and space, nothing can be properly comprehended; because, if there be natures self-existing, we have

\* Cic. de Fin., lib. v. c. 2.

† *i. e.*, indivisible particles.

‡ See his letter to Herodotus given by Diog. Laert., lib. x.

nothing analogous to enable us thoroughly to understand them.\* Epicurus probably took this also from Democritus, who affirmed that the complete truth was hidden from men too deeply for him to have any hope of attaining it; and this cautious mode of treating the subject perhaps was adopted, too, with a view of avoiding the fate of Anaxagoras, Socrates, and others, who had suffered for declaring too plainly that the gods of the people were no gods, and for endeavoring to introduce a more spiritual worship.

Astronomy had been curbed in like manner, by the decree that new notions respecting the heavenly bodies were not to be promulgated, under pain of death; and we find Epicurus speaking no less cautiously on this head; so cautiously, indeed, that it would be difficult to get at his opinion, did not the very doubt expressed show that he was not fully convinced that the generally received system was the right one. The stars may be extinguished at their setting and rekindled at their rising; or they may be obscured by the interposition of the earth during part of their revolution. The heavens may be carried round altogether, or the heavenly bodies may have a separate movement: they may be bigger, or they may be less than they appear to us, &c.:† from all which nothing can be gathered further than that he either could not, or would not speak more plainly.

With regard to morals Epicurus was much more explicit; and in his letter to Menœceus he gives

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\* Diog. Laert., lib. x., § 40. There is a variation, however, in different copies. The above reading is given on the authority of Gassendi, whose diligence in drawing together all that could throw light on the history and doctrines of Epicurus is universally acknowledged.

† See his letter to Pythocles, Diog. Laert., lib. x.

his code at some length. "No one," he says, "ought to think himself too young or too old for philosophic contemplation; since it is the great business of man to consider what is requisite to the living well:—happily as regards himself and worthily as regards his relations to society. And in the first place, as a needful constituent of this knowledge, we must take care that, believing God to be an immortal and perfectly happy Being, we attribute nothing to him that is inconsistent with these attributes. Thus, though there are gods, as appears evidently from our reason, yet they are not such as they are vulgarly esteemed to be. The following the opinion of the vulgar in this matter constitutes impiety, therefore, not the differing from them: for it is not the *general* anticipation or apprehension of the many respecting the gods that is false, but the *particulars* of their opinion on this subject are so: for they conceive great evils to be caused by the bad among the gods, and what is advantageous, by the good." And here Seneca, though no Epicurean, enables us to fill up the rest of the system, by reproaching Epicurus with reverencing God only as a parent, to be honored and worshiped for his excellence, without thinking of any gain to be obtained by so doing.\* "The wise man," continues Epicurus, "will not consider the loss of life an evil; but as food is chosen for its quality rather than its quantity, so he will endeavor to make his life pleasant rather than long. It is needful to satisfy our physical wants in a certain degree, both for the sake of living in comfort, and in order to keep the body tranquil, so as to leave the mind free

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\* "Deum, Epicure, vis videre colere, non aliter quam parentem? . . . nulla spe, nulla pretio inductus, sed propter ejus majestatem eximiam, supremamque naturam." Seneca de benef., lib. iv. c. 19.

from disturbance: for our endeavor should be to avoid suffering and perturbation; since pleasure is the great object of life. But it is not every kind of pleasure that will be sought by a wise man; for luxurious feasts are not needful to him who by temperance and exercise has made his bread and water sweet to his taste; therefore, when I speak of pleasure as the summum bonum, I do not mean licentious pleasures: for he only enjoys a truly happy life, who examines his desires by the light of sober reason, and determines which ought to be gratified, which repressed. In short, no man can live happily who does not live wisely and justly, and no man can live wisely and justly without being happy: for virtue and happiness cannot be separated. Nay, were it possible, it would be better to live wisely and to be unhappy, than to be irrational and fortunate. One who acts on these principles lives among men as if he were already a god: he has nothing about him that resembles the brute animal, but though a man, he lives among the immortals.”\*

Only one thing is wanting to the excellence of this system; but that one deficiency almost nullified it. Epicurus taught that death was annihilation; and it is in vain that we preach the excellence of virtue if we have no other life to expect, where what we have learned to love and admire may be enjoyed. The very longing after moral perfection becomes a torture if we have no hope that it will ever be fully gratified; for, though nothing can be truer than the position of Epicurus, that virtue and happiness can never be separated, yet this truth is only fully apparent to the mind when it dares to look beyond this world for the completion of its wishes. Then, indeed, the progress of

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\* Ep. ad Menœceum. Diog. Laert., lib. x.

moral improvement is delight, for every step gained promises yet another, and another; and death is only viewed as the removal of obstacles which delayed our onward course. The want of this stimulus in the Epicurean philosophy, made the admirable good sense and good feeling of the gentle founder of the sect unavailing; and when a greater than Epicurus preached the like doctrines, with the one great deficiency supplied as no unassisted human reason could have supplied it, the Epicureans had too generally forgotten the comment, and retained only the maxim that pleasure is the only good. "Let us eat and drink, for to-morrow we die," will generally be the termination of any system which rejects the tenet of the soul's immortality.

After Epicurus no other sect of importance sprung up among the Greeks; though slight variations were made in the teaching of the Academy, and the Stoics split into factions, rather than sects, for the real differences were not great. The Epicurean school kept its ground with less change than any other, and in the time of Plutarch even, the name of Metrodorus was authoritative among the disciples of that philosophy.\*

From Greece, the love of science spread to Rome, and Athens was to the rude people of that rising empire, what Paris once was to England and to the northern European nations. Greek was the fashionable language, and Athenian philosophers were the fashionable tutors. The elder Cato, clinging to early prejudices, when Carneades, the then head of the Academy, was sent on a political mission to Rome, procured his dismissal, lest he should corrupt the

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\* See Plutarch cont. Koloten.



youth of the city; yet the old man, before his death, yielded to the universal impulse so far as to learn Greek himself;\* and in spite of his warnings, the statesmen and warriors of the great republic became, for the most part, disciples of the Garden, the Stoa, or the Academy. Sylla too, though barbarian enough to cut down the groves of the Academy, amid the plunder of Athens brought home the writings of Aristoteles, which had so long been lost to the world; and finally, Greek philosophy found a voice in that most lucid of all writers, Cicero; who undertook to give his countrymen a kind of epitome of the doctrines of the different sects. Enough remains to us of these beautiful works to make the loss of any part of them most grievous. They are, or might be, in the hands of all; it is, therefore, needless to notice them farther here.

Cicero was nearly the last of that race of great men whom St. Paul so eloquently praises, "who having not the law, were a law unto themselves." He was too good for his cotemporaries, and was sacrificed to the profligacy of the times. The last preacher of righteousness had now left the stage, and A MIGHTIER VOICE,—though still and small, like that which followed the storm and the earthquake that shook Horeb to its foundations,—proclaimed the tidings of immortality to mankind, and confirmed the hopes which so many of the wise and good had cherished as their dearest treasure, during a long period of suffering. Philosophy had done its work;—men longed for THE TRUTH, and it was bestowed; noble Athenians were among the first converts to Christianity; Platonic philosophers among its most fearless martyrs; so truly had old Socrates fulfilled his mission, and taught

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\* See Plutarch in *Catone majore*.

men to contemn honors, wealth, or life, if they were to be bought by the sacrifice of principle. It is pleasant to see the affectionate remembrance with which these philosophic converts recur to the lessons of their early instructors, and we may draw thence a sure proof that the early Academy had faithfully executed its great charge, and become a true "school-master to bring men to Christ."

**THE END.**





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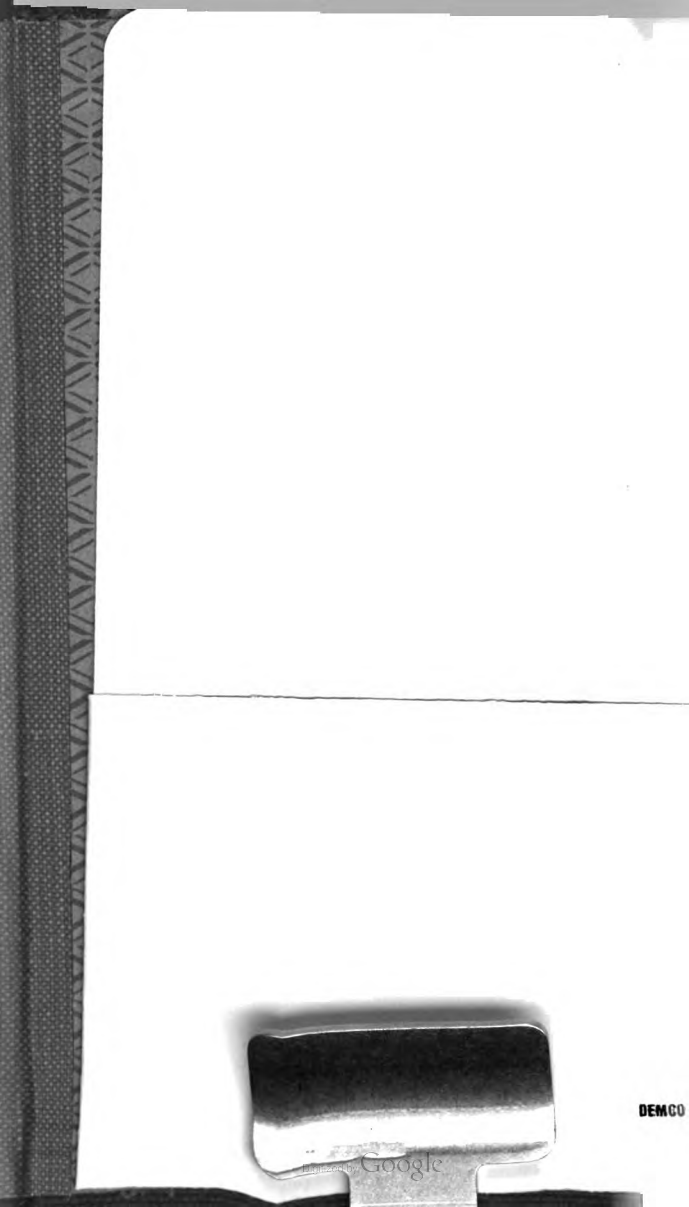


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